P. Jason Collins (TX Bar No. 24040711)
jcollins@rctlegal.com
Jeremy H. Wells (TX Bar No. 24098805)
jwells@rctlegal.com
Scotty G. Arbuckle, III (TX Bar No. 24089969)
tarbuckle@rctlegal.com
REID COLLINS & TSAI LLP
1301 S. Capital of Texas Hwy., Suite C300
Austin, TX 78746
T: 512.647.6100
F: 512.647.6129

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS

UNITED STATES OF AMERICA,
ex rel. INTEGRA MED ANALYTICS LLC,

Plaintiff,

v.

1. BAYLOR SCOTT & WHITE HEALTH,
2. BAYLOR UNIVERSITY MEDICAL CENTER – DALLAS,
3. HILLCREST BAPTIST MEDICAL CENTER,
4. SCOTT & WHITE HOSPITAL – ROUND ROCK,
5. SCOTT & WHITE MEMORIAL HOSPITAL – TEMPLE

Defendants.

Case No.: 17-CV-0886-DAE

SECOND AMENDED COMPLAINT

JURY TRIAL DEMANDED

TABLE OF CONTENTS

This is an action brought by Plaintiff/Relator Integra Med Analytics LLC ("**Relator**") on behalf of the United States of America pursuant to the Federal False Claims Act, 31 U.S.C. § 3729, et seq. In support thereof, Relator alleges as follows:

I. INTRODUCTION

1. Through a proprietary analysis of all claims submitted to Medicare nationwide since 2011, Relator uncovered that Baylor Scott & White Health and its affiliated hospitals (collectively, "**Baylor**" or the "**Baylor Defendants**") routinely used unwarranted Major Complication and Comorbidity secondary codes, which falsely inflated claims submitted to Medicare. A multi-faceted investigation of Baylor and its leadership—which included interviewing former employees, reviewing training and marketing materials, and extensive econometric analysis—confirmed that Baylor's false Medicare claims were not only intentional, but were part of a systematic effort by Baylor management to boost its Medicare revenue. Relator now brings this action to recover over $61.8 million paid by the United States as a result of Baylor's fraud.

2. Baylor was created from the combination of two Texas healthcare systems, Baylor Health Care System and Scott & White Healthcare. Together, these organizations formed one of the nation's largest health systems, operating approximately 20 inpatient short-term acute care hospitals with inpatient Medicare claims throughout central and north Texas. Baylor operates this system through a number of wholly-owned and/or controlled entities, including the defendant facilities. Baylor received approximately $639 million in Medicare reimbursements for inpatient stays at its short term acute care facilities in fiscal year 2015, accounting for approximately half of its gross revenue.

3. To establish amounts billed to Medicare for patient services, hospital systems like

Baylor must properly code such services according to preapproved standards. Baylor's Code of Conduct publicly espouses lofty coding standards through which it vows to implement "controls to prevent, detect and correct actions that do not comply with applicable federal and state laws," and "to submit claims to government … that reflect truth and accuracy."[1] In reality, Baylor's own corporate leadership disregarded these standards and created a systemwide culture that promoted increasing Medicare billing without regard for accuracy. Baylor's efforts ranged from extensive training on how to spike Medicare revenue, to pushing doctors to change their original diagnoses in ways that would lead to unwarranted MCCs.

4. In addition to identifying the Defendants' false claims through its proprietary analysis—and then confirming its findings through exhaustive investigation—Relator also performed extensive econometric analysis designed to eliminate conceivable innocent explanations. Thus, for instance, Relator's analysis rules out the possibility that the Defendants' inflated Medicare billings arise from an issue with the treating doctors or the type of patient that Baylor treats. Moreover, to be conservative, only the most extreme, statistically significant cases of upcoding have been identified by the Relator as fraudulent.

5. In short, Relator has determined that Baylor has submitted more than $61.8 million in false claims for Medicare reimbursement over the past seven years.

II. JURISDICTION AND VENUE

6. This Court has subject matter jurisdiction over this action pursuant to 31 U.S.C. § 3732(a) and 28 U.S.C. § 1331.

7. This Court has personal jurisdiction over each named Defendant because, inter alia,

[1] Compliance with Billing and Coding Laws and Regulations, Baylor Scott & White Health Code of Conduct (2017), *available at* https://goo.gl/KKhSaq.

the Defendants transacted business in this District; reside in this District; engaged in wrongdoing in this District; and/or caused the submission of false or fraudulent claims in this District. Moreover, 31 U.S.C. § 3732(a) provides for nationwide service of process, which is an independent ground for personal jurisdiction.

8. Venue is proper in this District under 31 U.S.C. § 3732(a) and 28 U.S.C. § 1391(b) and (c). During the relevant time period, a substantial portion of the events complained of that gave rise to Plaintiff's claims occurred in this District in violation of 31 U.S.C. § 3729 and § 3730.

9. There has been no public disclosure of the allegations herein. To the extent that there has been a public disclosure unknown to Relator, Relator is an "original source" under 31 U.S.C. § 3730(e)(4). Relator has direct and independent knowledge of the information on which the allegations are based and voluntarily provided the information to the Government before filing this qui tam action based on that information. *See* 31 U.S.C. § 3730(e)(4).

III. PARTIES

10. Relator Integra Med Analytics LLC is a Texas limited liability company with its principal place of business in Austin, Texas.

11. Relator is an associated company of Integra Research Group LLC, which specializes in using statistical analysis to uncover and prove fraud. Integra Research Group LLC's sister company, Integra REC LLC, has extensive experience using statistical analysis to detect and prove fraud, specifically in mortgage-backed securities and other financial markets. Integra REC LLC has successfully initiated numerous cases under the False Claims Act.

12. Defendant Baylor Scott & White Health is a Texas corporation with its principal place of business located at 3500 Gaston Avenue, Dallas, TX 75246, and its registered agent listed as CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, TX 75201.

13. Defendant Baylor University Medical Center – Dallas is a Texas corporation with its principal place of business located at 3500 Gaston Avenue, Dallas, TX 75246, and its registered agent listed as CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, TX 75201.

14. Defendant Hillcrest Baptist Medical Center is a Texas corporation with its principal place of business located at 100 Hillcrest Medical Boulevard, Waco, TX 76712, and its registered agent listed as CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, TX 75201.

15. Defendant Scott & White Hospital – Round Rock is a Texas corporation with its principal place of business located at 300 University Boulevard, Round Rock, TX 78665, and its registered agent listed as CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, TX 75201.

16. Defendant Scott & White Memorial Hospital – Temple is a Texas corporation with its principal place of business located at 2401 South 31st Street, Temple, TX 76508, and its registered agent listed as CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, TX 75201.

IV. SUBSTANTIVE ALLEGATIONS

A. Overview of Medicare Reimbursement and Upcoding

17. Medicare makes payments to hospitals on a per-discharge basis, *i.e.*, one payment for each inpatient hospital stay. The payment is designed to cover the average cost of resources needed to treat each patient's needs. To account for the patient's needs, Medicare assigns each discharge to a diagnosis related group (a "**DRG**"), which groups patients with similar clinical problems that are expected to require similar amounts of hospital resources.[2] The DRG is the single most impactful factor in determining the average payment for a claim, which can be further adjusted by hospital-specific factors such as market conditions in the hospital's city, indirect

[2] *See* Medpac, *Hospital Acute Inpatient Services Payment System Payment Basics*, Oct. 2014.

medical education payments, and disproportionate share payments.

18. The DRG is primarily determined by three types of codes from a Medicare claim: the principal diagnosis code, surgical procedure codes, and secondary diagnosis codes. The principal diagnosis code is defined as the "condition established after study to be chiefly responsible for occasioning the admission of the patient to the hospital for care."[3] Surgical procedure codes represent surgical procedures performed in an operating room setting at the hospital. Secondary diagnoses represent "all conditions that coexist at the time of admission, that develop subsequently, or that affect the treatment received and/or the length of stay."[4]

19. There are more than 330 base DRGs, and each base DRG can have up to three severity levels: (i) without Complication or Major Complication, (ii) with Complication, and (iii) with Major Complication.[5] The secondary diagnoses on the claim determine the severity level of a DRG. The Centers for Medicare and Medicaid Services (the "**CMS**") publishes a list of codes each year that, when added to a claim, result in the claim being considered a Complication or Comorbidity (a "**CC**") or Major Complication or Comorbidity (an "**MCC**"). Adding a CC secondary code to a claim can increase the value of the claim from anywhere between approximately $1,000 and $10,000. Adding an MCC secondary code can increase the value $1,000 to $25,000. Hospitals are thus incentivized to add unwarranted secondary diagnosis codes to Medicare reimbursement claims.

---

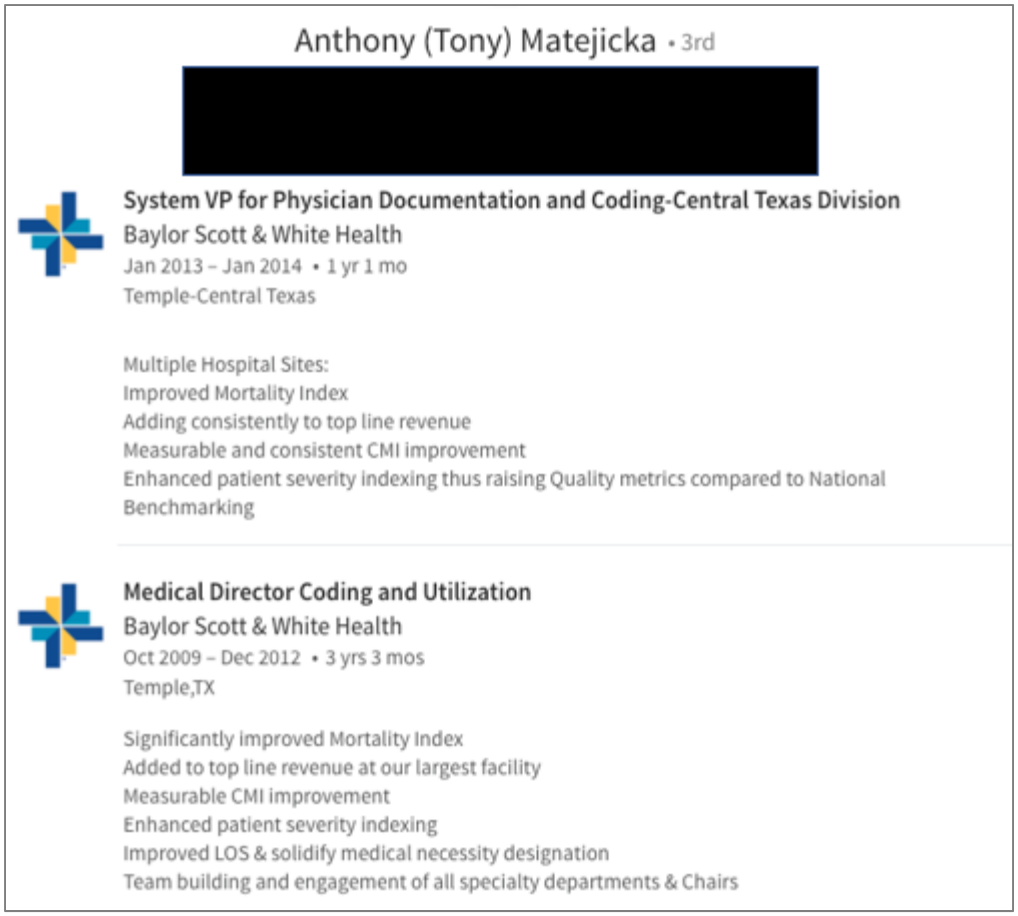
[3] *See* Centers for Disease Control, *ICD-9-CM Official Guidelines for Coding and Reporting*, Oct. 1, 2011 at 88, *available at* https://goo.gl/DC55Wx.

[4] *Id.* at 91.

[5] *See* Medpac, *Hospital Acute Inpatient Services Payment System Payment Basics*, Oct. 2014.

B. Relator has uncovered a culture of non-compliance at Baylor, whose leadership actively encouraged doctors to apply unnecessary MCCs

20. Like most hospital groups, Baylor has a clinical documentation improvement ("**CDI**") program. These programs are typically designed to promote the accurate documentation of a patient's diagnoses and treatments such that they can be properly coded for reimbursement. At Baylor, however, CDI efforts are primarily geared toward inflating the hospital system's Medicare revenue. Indeed, the former head of Baylor's CDI program in Central Texas, Anthony Matejicka, boasts that he "add[ed] consistently to top line revenue" and brought about "improvement" in Baylor's Case Mix Index ("**CMI**"), which is influenced by a hospital's CC and MCC rates. Matejicka also boasted about "raising Quality metrics" through "enhanced patient severity," which is likewise increased through coding higher CC and MCC rates.



Anthony (Tony) Matejicka • 3rd

[redacted]

System VP for Physician Documentation and Coding-Central Texas Division
Baylor Scott & White Health
Jan 2013 – Jan 2014 • 1 yr 1 mo
Temple-Central Texas

Multiple Hospital Sites:
Improved Mortality Index
Adding consistently to top line revenue
Measurable and consistent CMI improvement
Enhanced patient severity indexing thus raising Quality metrics compared to National Benchmarking

Medical Director Coding and Utilization
Baylor Scott & White Health
Oct 2009 – Dec 2012 • 3 yrs 3 mos
Temple,TX

Significantly improved Mortality Index
Added to top line revenue at our largest facility
Measurable CMI improvement
Enhanced patient severity indexing
Improved LOS & solidify medical necessity designation
Team building and engagement of all specialty departments & Chairs

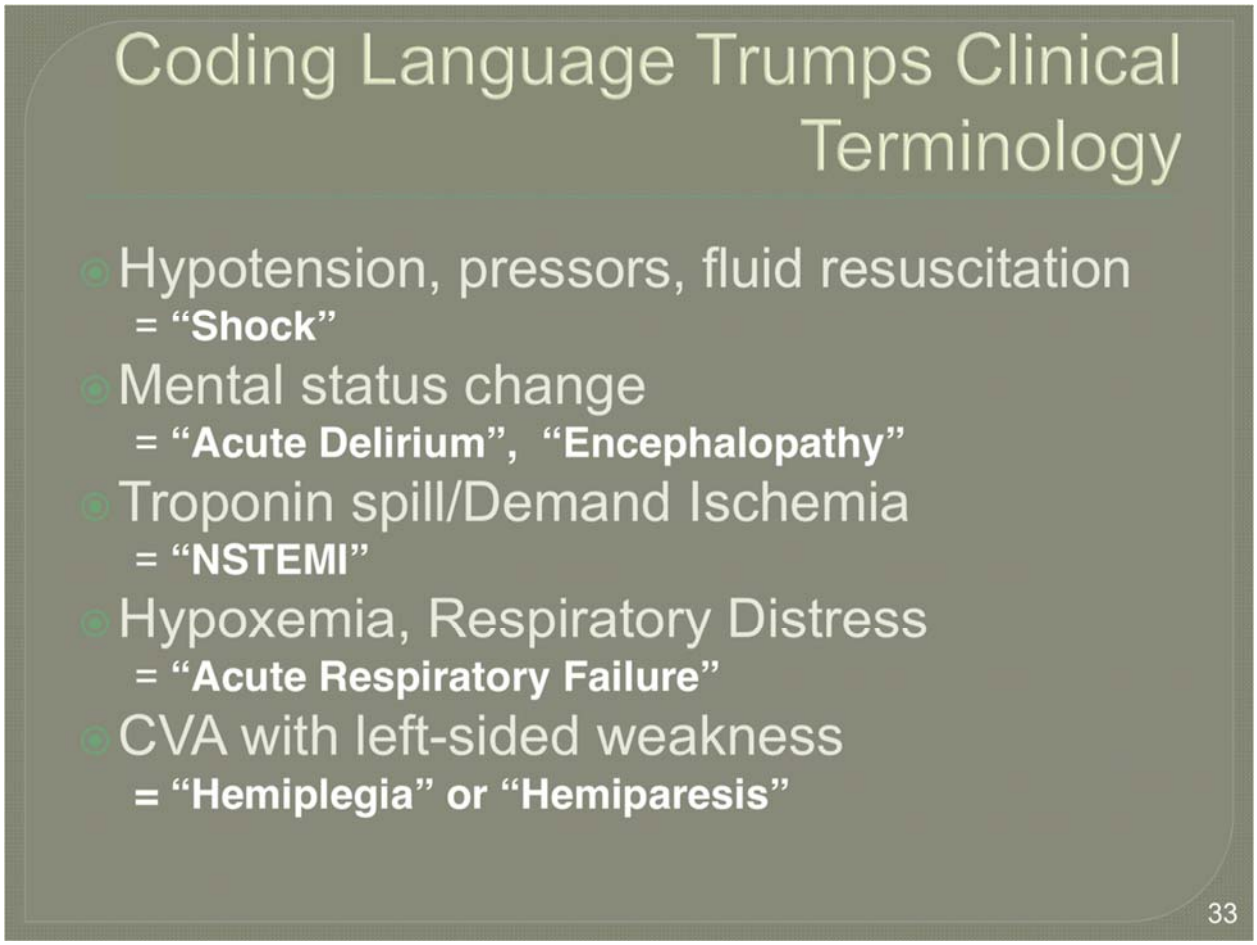
21. Matejicka effectively executed his multifaceted scheme to improve revenue and quality metrics by increasing the coding of MCCs (including personally training CDI specialists and doctors), disseminating tip sheets to guide doctors towards coding MCCs, and deploying a team of CDI specialists whose job was to persuade doctors to change their documentation to reflect higher severity of illness than warranted.

22. Medical coders also received pressure from Baylor HIM (Health Information Management) leadership to upcode. After Matejicka left Baylor in January 2014, the rate of MCCs declined slightly. But medical coders then began to increasingly receive pressure directly from HIM leadership to code unethically. According to a former medical coder, the HIM department at Baylor issued directives to her coding supervisor to code a certain way, even if it was not appropriate. This coder overheard her supervisor saying "that's not right" during conversations with Baylor HIM management. The medical coder received instructions that her supervisor forwarded to her from Baylor management with directives to code in a specific way, and eventually quit because she could no longer continue to work in an environment where she "was continually getting directives to compromise her integrity." Analysis by Relator is consistent with this behavior, with rates of misstated MCCs identified by Relator decreasing after Matejicka's departure, then increasing in recent years corresponding to increasing pressure from Baylor's HIM team to code unethically.

1. Baylor trained its doctors and CDI staff to upcode MCCs

23. Under Matejicka, Baylor's employee training was singularly focused on coding for MCCs. A former Baylor CDI employee confirmed that Matejicka personally trained staff on key words to increase Medicare reimbursements and received a list of MCCs to focus on. Similarly, a former medical coder disclosed that Matejicka trained CDI employees to walk around with a list of MCCs to look for opportunities to assign MCCs as secondary diagnoses.

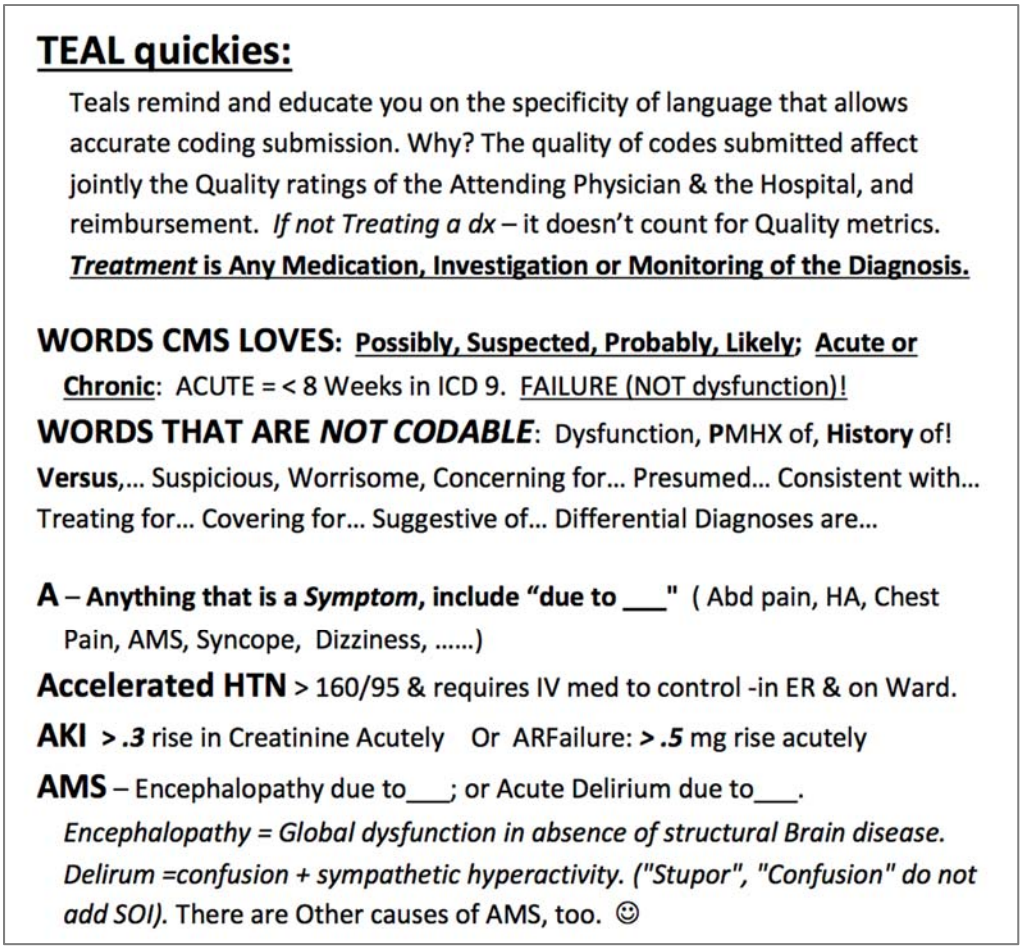
24. Baylor also made clear to its doctors how important their coding efforts were to both the Defendants' and the doctors' bottom line and quality metrics. Matejicka even gave presentations specifically training doctors on why and how they should upcode. In an August 20, 2012 presentation titled "Fundamentals of Hospital Medicine: What No One Taught Us!," Matejicka encouraged doctors to use "magic words" to "provide triggers for reimbursement," leading to higher paying CCs and MCCs. These "magic words" included "encephalopathy" and "acute respiratory failure," two of the MCCs that Relator's analysis identified as being misused by Baylor. Matejicka encouraged doctors to use these words even if they might not be clinically appropriate, arguing that "Coding Language Trumps Clinical Terminology."



25. Matejicka made sure to emphasize that following his guidelines for coding would increase not only Baylor's revenue but also doctors' salary. Indeed, his presentation flatly states, "Your hospital data will determine your income!" He then closes the presentation by asking them, "Do you want to 'see one more patient' or take one minute to improve your documentation ???," suggesting that using "magic words" would generate equivalent revenue to seeing an additional patient. This presentation also described an example where adding an MCC would both increase hospital reimbursement by $8,444.94 as well as improve pay for performance ("**P4P**") metrics for doctors, resulting in "SO MUCH WIN."

26. Matejicka's program openly steered doctors away from non-MCC diagnoses toward specific, higher-paying MCCs. This effect is seen in a doctor tip sheet called "Teal Quickies,"[6] which provided guidance for doctors to clinically document in a way that maximizes Medicare revenue. For instance, in training doctors on how to document altered mental status (or "**AMS**"), Baylor encouraged doctors to diagnose encephalopathy or acute delirium, explaining that doing so would allow coders to increase the patient's severity of illness (or "**SOI**"). Baylor blithely added that "there are Other causes of AMS, too ☺."

[6] Teal is the color of Scott & White Healthcare's logo.



TEAL quickies:

Teals remind and educate you on the specificity of language that allows accurate coding submission. Why? The quality of codes submitted affect jointly the Quality ratings of the Attending Physician & the Hospital, and reimbursement. *If not Treating a dx* – it doesn't count for Quality metrics. ***Treatment* is Any Medication, Investigation or Monitoring of the Diagnosis.**

WORDS CMS LOVES: **Possibly, Suspected, Probably, Likely; Acute or Chronic**: ACUTE = < 8 Weeks in ICD 9. FAILURE (NOT dysfunction)!

WORDS THAT ARE *NOT CODABLE*: Dysfunction, **PMHX of, History of!**

Versus,... Suspicious, Worrisome, Concerning for... Presumed... Consistent with... Treating for... Covering for... Suggestive of... Differential Diagnoses are...

A – Anything that is a *Symptom*, include "due to ___" (Abd pain, HA, Chest Pain, AMS, Syncope, Dizziness, ...)

Accelerated HTN > 160/95 & requires IV med to control -in ER & on Ward.

AKI **> .3** rise in Creatinine Acutely Or ARFailure: **> .5** mg rise acutely

AMS – Encephalopathy due to___; or Acute Delirium due to___.

Encephalopathy = Global dysfunction in absence of structural Brain disease. Delirum =confusion + sympathetic hyperactivity. ("Stupor", "Confusion" do not add SOI). There are Other causes of AMS, too. ☺

2. Baylor pressured doctors to change their diagnoses

27. Baylor did not stop pushing doctors after their original diagnoses. If, despite training from Matejicka, a doctor's initial diagnosis did not warrant a CC or MCC, Baylor would often send the doctor a "query" encouraging doctors to amend the assessment. Baylor's queries would ask doctors to "specify" their diagnoses, and would suggest either specific revenue-increasing CCs or MCCs or provide options listing several possible CCs and MCCs—often including conditions wholly unrelated to the patient's primary diagnosis.

28. Relator has obtained "documentation clarification sheets" used by Baylor CDIs to query physicians for additional documentation. These sheets reveal a clear intent towards influencing doctors to code higher-paying CCs and MCCs. In the query sheet for altered mental status, doctors are asked to document the underlying cause and are only provided with options which could yield a CC or MCC. Of the 11 options listed, 5 can directly be coded as MCCs (metabolic encephalopathy, toxic encephalopathy, hypertensive encephalopathy, sepsis and CVA) and 3 can directly be coded as CCs (acute delirium, dementia, and seizure). The remaining 3 (medication effect, electrolyte abnormalities and dehydration) can be used with altered mental status to code for toxic or metabolic encephalopathy.

Altered mental status is a SYMPTOM and not a diagnosis. Please document the possible or probable underlying etiology of this symptom.

Can the diagnosis be further specified as:

"Altered mental status likely due to _____".

Metabolic Encephalopathy	Acute Delirium	CVA
Toxic Encephalopathy	Dementia	Dehydration
Hypertensive Encephalopathy	Medication effect	Seizure
Sepsis	Electrolyte abnormalities	Unable to be determined
Other _____		

Please remember to document in the Progress Notes and Discharge Summary, as this note is NOT part of the permanent medical record. Please leave this note on the chart.

☐ I disagree, see my comments.

In responding to this query, please exercise your independent professional judgment. The fact that a question is asked does not imply that any particular answer is desired or expected. We greatly appreciate your clarification on this issue.

This is **NOT** part of the permanent record, however, **PLEASE LEAVE ON THE CHART**.

This is a **PRIVILEGED and CONFIDENTIAL** document, not to be copied or distributed.

#3 Altered Mental Status

Rev. 3/2013

29. There are other common causes for altered mental status *that do not yield an CC or MCC* and are not included in the Scott & White documentation clarification sheet. For example, in a documentation tip card issued by the Department of Veterans Affairs, other, non-CC or non-

MCC, causes for altered mental status are listed such as "Alzheimer's Disease," "Lewy body dementia," or "Psychiatric Illness."

Documentation Tip Card:
Documenting Altered Mental Status

Documenting an alteration in mental status is vague and may not accurately represent the underlying condition or suspected cause. For the continuity of care of our Veterans it is important to be as precise as possible. The three things to consider when documenting an alteration in mental status are:

Chronicity	Acute, Chronic, Acute on Chronic, Other, or Unable to determine
Nature:	Dementia, Delirium, Psychosis, Obtundation, Other, or Unable to Determine.
Underlying Cause:	Alzheimer's Disease, Encephalopathy (indicate the type and underlying cause), Lewy body dementia, Acute stroke, Late effect of stroke, Transient Ischemic Attack (TIA), Generalized cerebral edema, Seizure disorder (indicate its nature and whether status epilepticus is present or if symptoms are intractable), Normal pressure hydrocephalus, Psychiatric Illness (specify type if possible), Other, or Unable to Determine

If you don't know the cause, indicate what you are working up or ruling out.

30. A similar bias towards coding MCCs is found in the Scott & White documentation clarification sheet for "Diseases of the Respiratory System," an excerpt of which is found in the following figure. Even the name Baylor gave to the document, "#35 Respiratory Failure" indicates that CDIs used this sheet in order to get doctors to document respiratory failure as opposed to other non-CC or non-MCC respiratory diseases. The sheet specifically defines acute respiratory failure, an MCC, and not any other respiratory disease. All of the options listed except for "Hypoxemia" are CCs or MCCs, and even Hypoxemia is simply a symptom that may indicate the patient has one of the other respiratory diagnoses listed. Notably, the list leaves off a number of other respiratory system diagnoses which are not CCs or MCCs, including "Postinflammatory pulmonary fibrosis," "Other emphysema," and "Allergic rhinitis."

Acute respiratory failure is a condition characterized by inadequate exchange of oxygen and carbon dioxide by the lungs. The diagnosis is generally used when the arterial Pa 0_2 falls below 60 mm Hg and/or the arterial Pa $C0_2$ rises above 50 mm Hg or pulse ox <89%. The use of artificial ventilation such as **BiPAP** would also qualify.

Other possible clinical situations that might have acute respiratory failure include:

Agitation	Tachypnea	COPD
Tachycardia	Confusion	Asthma
Clinical fatigue	Somnolence	Restrictive Lung Disease

Conditions where chronic respiratory failure may be present include continuous 0_2, CPAP, BiPAP, or ventilation through a tracheostomy at home.

Can the diagnosis be further specified as:

Acute respiratory failure ---------- Hypoxic Hypercapnic
Acute on chronic respiratory failure
Chronic respiratory failure Acute Pulmonary Edema
Hypoxemia Chronic Pulmonary Edema
Acute respiratory distress – lower than normal O_2 sats, pt dyspneic but not meeting Acute Resp. Failure guidelines above.
Not Clinically Determined Present on Admission
Other _____

Please remember to document in the Progress Notes and Discharge Summary, as this note is NOT part of the permanent medical record. Please leave this note on the chart.

☐ I disagree, see my comments.

In responding to this query, please exercise your independent professional judgment. The fact that a question is asked does not imply that any particular answer is desired or expected. We greatly appreciate your clarification on this issue.

This is **NOT** part of the permanent record, however, **PLEASE LEAVE ON THE CHART**.
This is a **PRIVILEGED and CONFIDENTIAL** document, not to be copied or distributed.

#35 Respiratory Failure
Rev. 3/2013

31. In another example, the documentation tip sheet for comorbidities contains completely unrelated CC or MCC inducing diagnoses, ranging from peritonitis (a gastrointestinal disorder) to UTI (urinary tract infection). Moreover, none of the options on the tip sheet have related and are thus designed to lead doctors to choose certain diagnoses. For example, the sheet mentions "pleural effusion," which is a CC or MCC, but fails to suggest "pleurisy without effusion," which is neither a CC nor an MCC.

Can the diagnosis be further specified as:

Peritonitis	Atelectasis	COPD with acute exacerbation
UTI	Ileus	Shock- and please specify type as (Cardiogenic, Hypovolemic, septic, etc.)
Pleural effusion	Unable to be determined	

Other _____

Please remember to document in the Progress Notes and Discharge Summary, as this note is NOT part of the permanent medical record. Please leave this note on the chart.

☐ I disagree, see my comments.

In responding to this query, please exercise your independent professional judgment. The fact that a question is asked does not imply that any particular answer is desired or expected. We greatly appreciate your clarification on this issue.

This is **NOT** part of the permanent record, however, **PLEASE LEAVE ON THE CHART**.

This is a **PRIVILEGED and CONFIDENTIAL** document, not to be copied or distributed.

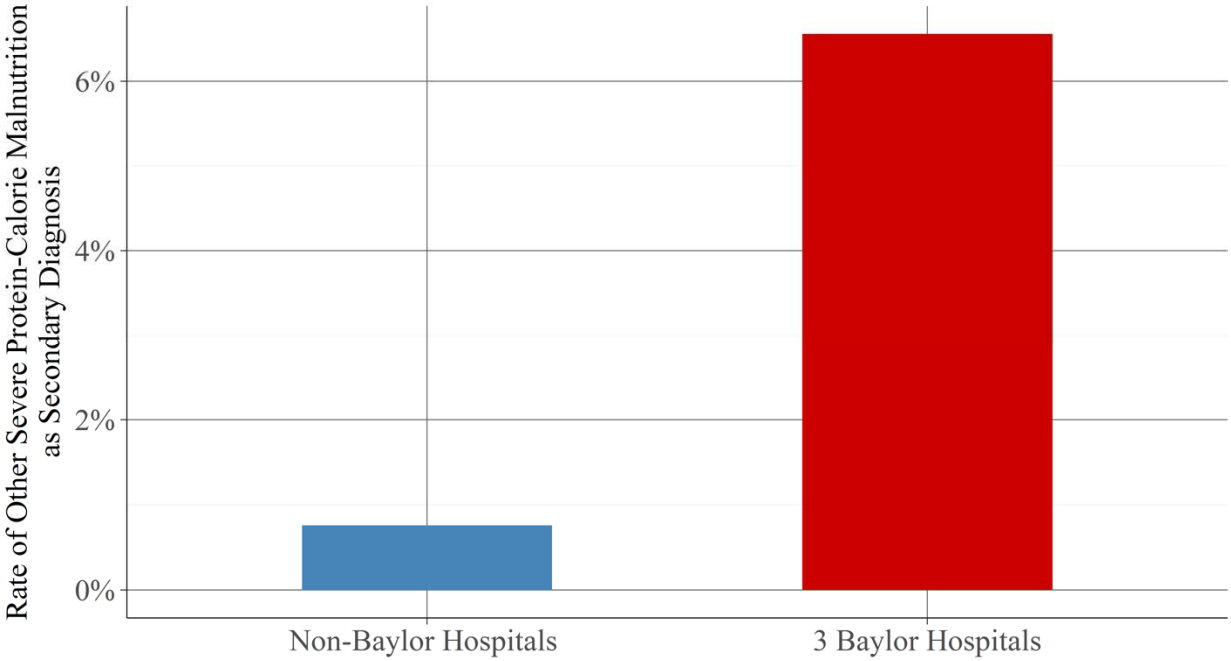
32. Baylor also prompted doctors to document CCs and MCCs with post-surgery progress notes, some with particularly uncommon pairings. For instance, in its progress notes for plastic surgery patients, Baylor gave doctors a multiple-choice option to include severe protein calorie malnutrition.

Comorbid Conditions and General Description of Their Treatments:

(must state treatment)	☐ protein calorie malnutrition-	☐ acute/chronic respiratory failure-	☐ acute/chronic renal failure-
☐ hyponatremia-	☐ severe protein calorie malnutrition-	☐ COPD w/ acute exacerbation-	☐ AKI with acute tubular necrosis-
☐ hypernatremia-	☐ protein calorie malnutrition&emaciation-	☐ shock, cardiogenic, hypovolemic, septic	☐ AKI-
☐ acute blood loss anemia-	☐ pathologic fracture due to-	☐ BMI <19, cachectic-	☐ ARF with specified lesion-
☐ precipitous drop in hematocrit-	☐ encephalopathy-	☐ BMI >40, morbid obesity-	☐ Major depressive affective disorder-
☐ NSTEMI-	☐ pleural effusion-	☐ pancytopenia-	☐ Bipolar disorder (type 1, type 2)-
☐ pneumonia due to _____organism-	☐ atelectasis-	☐ acidosis-	☐ illicit drug use...continuous use-
☐ decubitus stage___ location_____-	☐ ileus-	☐ alkalosis-	☐ illicit drug use...dependence-
☐ CVA-	☐ atrial/ventricular flutter-	☐ 2nd/3rd degree heart block-	☐ acute/chronic systolic/diastolic CHF-
☐ Other:			

33. Not surprisingly, Relator's analysis shows that the Baylor's rate of severe protein malnutrition in plastic surgery claims dwarfs the national rate. In fact, a staggering 6.56% of the

plastic surgery patients treated by three Baylor Defendants were given the secondary diagnosis of severe protein-calorie malnutrition, over 8 times the national average.[7]



34. Leading queries and progress notes were only part of Baylor's strategy to influence doctors to inappropriately code CCs and MCCs. According to a former medical coder, CDIs were effectively "trained in sales" to generate revenue by convincing doctors to change their clinical documentation in inappropriate ways. This coder recalls Matejicka "telling CDIs things that were totally not true," and as a result of the deliberate effort to promote the coding of MCCs, some MCCs were inappropriately applied.

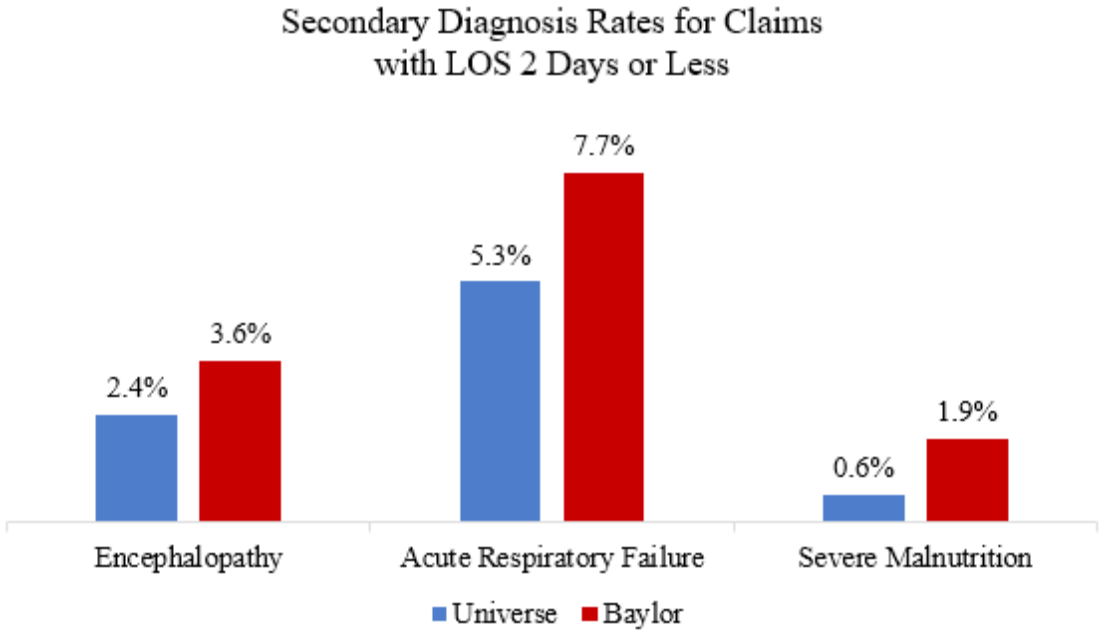
35. According to another former coding and compliance staff member at Scott & White, CDIs pressured doctors to record MCCs in an effort to increase revenue. For example, CDIs influencing doctors to record acute respiratory failure (an MCC identified by Relator for excessive

[7] The 3 Baylor Hospitals in the chart refer to: Hillcrest Baptist Medical Center, Scott & White Hospital—Round Rock and Scott & White Memorial Hospital—Temple. Relator's analysis is based on plastic surgery claims from 2011 through the third quarter of 2015.

use) instead of COPD exacerbation because that is what "[CDIs] want to hear…doctors have been told and told and told so they do." The staff member added, "CDIs should be questioning acute respiratory failure instead of insisting." He also observed the inappropriate documentation of other MCCs for patients with length of stay of two days or less, even though such diagnoses would require longer lengths of stay for treatment.

36. These findings are consistent with Baylor's culture of pushing doctors to apply CCs and MCCs without regard for accuracy or necessity to boost the hospital's bottom line and improve its quality rating. Relator's analysis of Medicare claims shows that Baylor doctors complied with this encouragement, leading to the excessive coding of Misstated MCCs identified in this action. Indeed, Baylor carried out this targeted scheme to upcode Medicare claims (evidenced in part by Matejicka's focus on Medicare billing in his presentations to Baylor doctors), while avoiding detection by Medicare auditors. A former coding and compliance staff at Baylor recalls Medicare being the most lenient among health insurance payors, noting, "If [patients] stay here two days and you put acute respiratory failure on that chart I guarantee you, unless it's Medicare, you are going to get audited…you are least likely to get audited by traditional Medicare because RACs [recovery audit contractors] are not doing medical necessity reviews. I don't think they have done those in several years." Indeed, Relator analyzed the rates of diagnoses for the three MCCs identified for excessive use, and found that Baylor coded them up to 3 times more than the national average for patients with length of stay of two days or less, as seen in Figure 1.

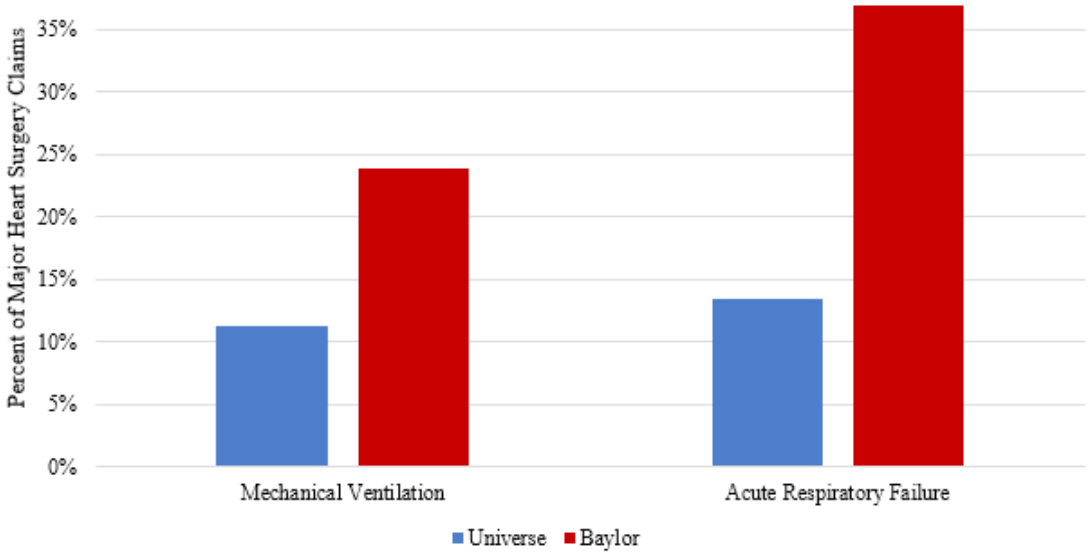
Figure 1: Secondary Diagnosis Rates for Claims with Length of Stay 2 Days or less



3. Baylor provided unnecessary treatment, which enabled it to code MCCs

37. Baylor's zeal to increase revenue through coding MCCs even included the provision of unnecessary treatment. Baylor purposefully placed and kept post-operative patients on ventilator support, thus enabling it to document one of the clinical indicators for acute respiratory failure, one of the MCCs identified by Relator for excessive usage. As an example, Relator found that Baylor patients undergoing major heart surgery were placed on mechanical ventilation over twice the national average. Correspondingly, for post-operative heart surgery patients Baylor coded acute respiratory failure (not present on admission) at 36.9% which is 2.75 times higher than the national average of 13.4%, as seen in Figure 2.

Figure 2: Rates of Mechanical Ventilation and Respiratory Failure (Not Present on Admission) for Major Heart Surgery Claims



38. The high rate of post-operative respiratory failure at Baylor is even more dubious since according to clinical documentation expert Dr. Robert Gold, post-operative respiratory failure should be extremely rare and he cautions against coding it. Another CDI expert, Dr. Cesar Limjoco, notes, "patients being purposely maintained on the ventilator after heart surgery or any surgery because of weakness, chronic lung disease, massive trauma are NOT in acute respiratory failure." What is not dubious is that diagnosing post-operative acute respiratory failure can lead to large increases in reimbursement. According to another CDI expert, Dr. Richard Pinson, "'Postop'…respiratory failure is classified as one of the most severe, life-threatening reportable surgical complications a patient can have. The diagnosis of respiratory failure following surgery often results in a huge payment increase to the hospital—sometimes $20,000 to $30,000 or even more."

39. Relator's analysis reveals that in spite of the high bar for accurately coding acute respiratory failure, Baylor was much more liberal in its application. In its documentation clarification sheet to doctors for "Diseases for the Respiratory System", doctors are told that "The

use of artificial ventilation such as BiPAP would also qualify" for diagnosing acute respiratory failure. To execute this scheme, Baylor trained its staff to code acute respiratory failure based on the use of a ventilator, even though other clinical indicators might have suggested otherwise.

C. Relator's Methodology

40. Relator uncovered Baylor's fraud by employing unique algorithms and statistical processes to analyze inpatient claims data for short term acute care hospitals from 2011 through June 2017,[8] obtained from CMS. These proprietary methods have allowed Relator to identify with specificity the false claims made by Baylor to fraudulently inflate revenue on Medicare claims. Relator's analysis focused on identifying certain secondary diagnoses codes—MCCs—that were fraudulently added by Baylor to Medicare claims to increase reimbursements.

41. Relator first formed groupings corresponding to 184 specific principal diagnosis codes. To control for the patient's principal diagnosis, Relator used these groupings as comparative "bins." Within each bin, Relator compared the usage rate of specific MCCs at hospitals in the Baylor system to usage rates in other acute care inpatient hospitals. In addition, to ensure that only the truly fraudulent claims were analyzed, Relator excluded any claims for which adding an MCC did not increase the value.[9] Similarly, Relator excluded any claims involving patients who died in the course of their treatment, as these claims tend to involve patients that are sicker and have higher rates of MCCs.

42. Given that some natural variation in usage rates among hospitals is expected, Relator used two filters to further ensure that it identified truly abnormal usage. First, only

[8] Only claims through the second quarter of 2017 were analyzed by Relator. Claims after June 30, 2017 have not yet been made available to Relator.

[9] Some diagnosis related groups do not have an MCC severity level, and as such, adding an MCC does not increase the reimbursement amount.

instances where MCCs were used more than twice the national rate or were used at a rate three percentage points higher than in the other hospitals were considered false claims. Second, Relator validated the results of its analysis by determining the statistical significance of each fraudulent pattern used by Baylor. Relator only flagged claim groupings where there was less than a 1 in 1,000 chance of Relator's findings being due to chance. Under this approach, Relator identified 209 combinations of principal diagnosis codes and Misstated MCCs in which Baylor excessively upcodes. Relator included in this complaint only the principal diagnosis code groups that met these criteria and were used excessively by Baylor.

43. For example, Baylor and other hospitals have a large number of claims involving a Nonrheumatic Aortic Valve Disorders. Relator has found that among Baylor's more than 838 claims involving a Nonrheumatic Aortic Valve Disorders, 59 had had an accompanying secondary MCC of encephalopathy,[10] representing 7.04 percent of their Nonrheumatic Aortic Valve Disorders claims. The other non-Baylor hospitals, used by Relator for benchmarking, had more than 200,000 Nonrheumatic Aortic Valve Disorders claims, but only 2.67 percent of those claims reported encephalopathy as an MCC. In other words, Baylor coded encephalopathy on these claims at a rate that is 2.64 times higher than comparable hospitals—and profited nearly $13,000 each time it did so.

44. While Relator's precise benchmarking of medical billing is unique, experts have developed and applied similar benchmarks in financial return literature.[11] Benchmarking has the

[10] See section IV.D.1.A for a description of encephalopathy and the relevant codes that are included.

[11] See the widely-used methodology developed by Kent Daniel, Mark Grinblatt, Sheridan Titman, Russ Wermers, *Measuring Mutual Fund Performance with Characteristic-Based Benchmarks*, The Journal of Finance, vol. 52(3) (1997), at 1035–58. This methodology is first applied to measuring hedge-fund performance by, John M. Griffin and Jin Xu, *How Smart Are the Smart Guys? A Unique View from Hedge Fund Stock Holdings*, Review of Financial Studies, Vol. 22.7 (2009), at 2531–70.

advantage of allowing for very specific and comparative groupings. This avoids imposing specific linearity on the data, which in turn gives Relator's methodology more statistical power and precision.

45. To further validate its conclusions and control for other explanations, Relator ran a bin-based fixed effect linear regression model. Separate regressions were run for claims under each principal diagnosis bin and Relator included variables to control for patient characteristics such as age, gender, and race, as well as county demographic factors such as the unemployment rate, median income, and urban-rural differences. Additionally, variables for the length of stay and discharge status were included to control for the patient's health and overall claim severity. Relator also tested for the potential impact that doctors, individual patients, and a hospital's region could have on MCC rates. Even when considering all of these factors, Baylor's MCC usage rate is significantly higher than at other hospitals.

D. Defendants' False Claims

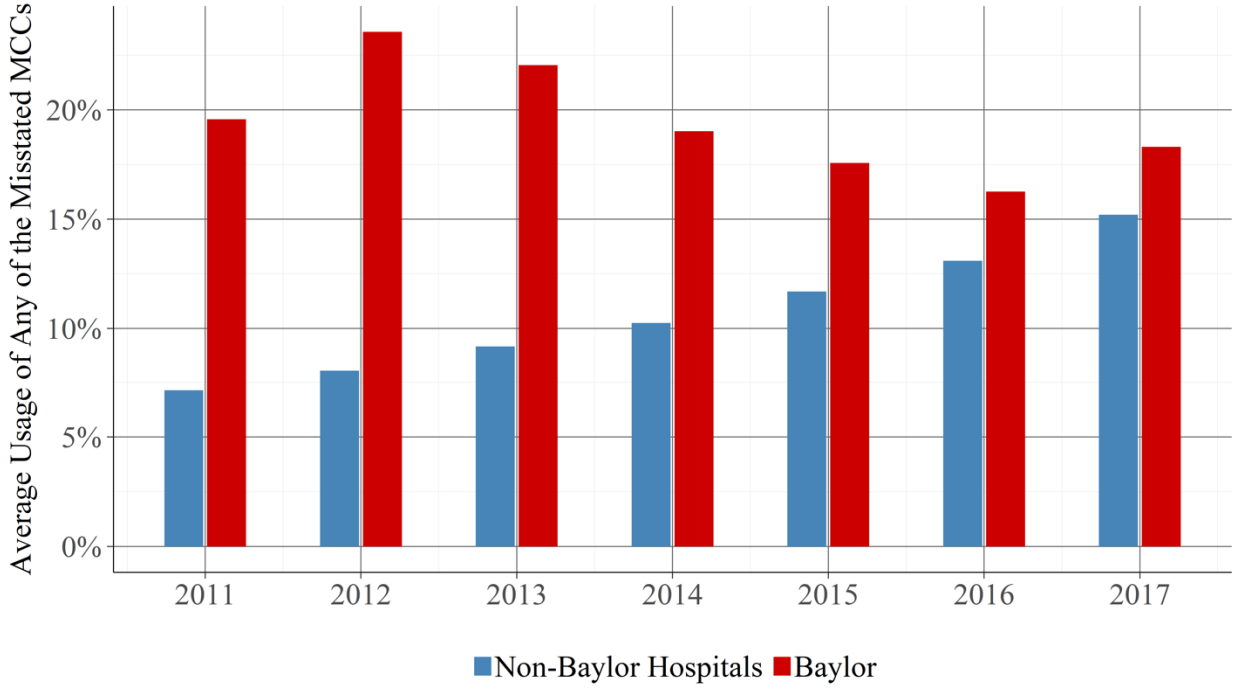
1. The False Claims made by Baylor

46. Relator has determined that Baylor primarily used three categories of secondary MCC codes to increase the value of its claims: encephalopathy (including toxic encephalopathy), respiratory failure (which also includes pulmonary insufficiency), and severe malnutrition (collectively, the "**Misstated MCCs**").[12] These will be discussed in more detail in the following sections.

[12] Three of Baylor's hospitals (Hillcrest Baptist Medical Center, Scott & White Hospital – Round Rock, and Scott & White Memorial Hospital) excessively used all three major complications. A fourth hospital (Baylor University Medical Center – Dallas) is only alleged in this complaint to have upcoded encephalopathy to make a false claim. Hence, Baylor University Medical Center – Dallas is only included in the encephalopathy analysis.

47. As illustrated in Figure 3, Baylor used the Misstated MCCs at a significantly higher rate than other hospitals. Specifically, non-Baylor hospitals used one of these three codes on approximately 10.27 percent of claims from 2011 through June 2017, while Baylor hospitals used one of these three codes on 19.39 percent of such claims—or 1.89 times the rate at other hospitals.

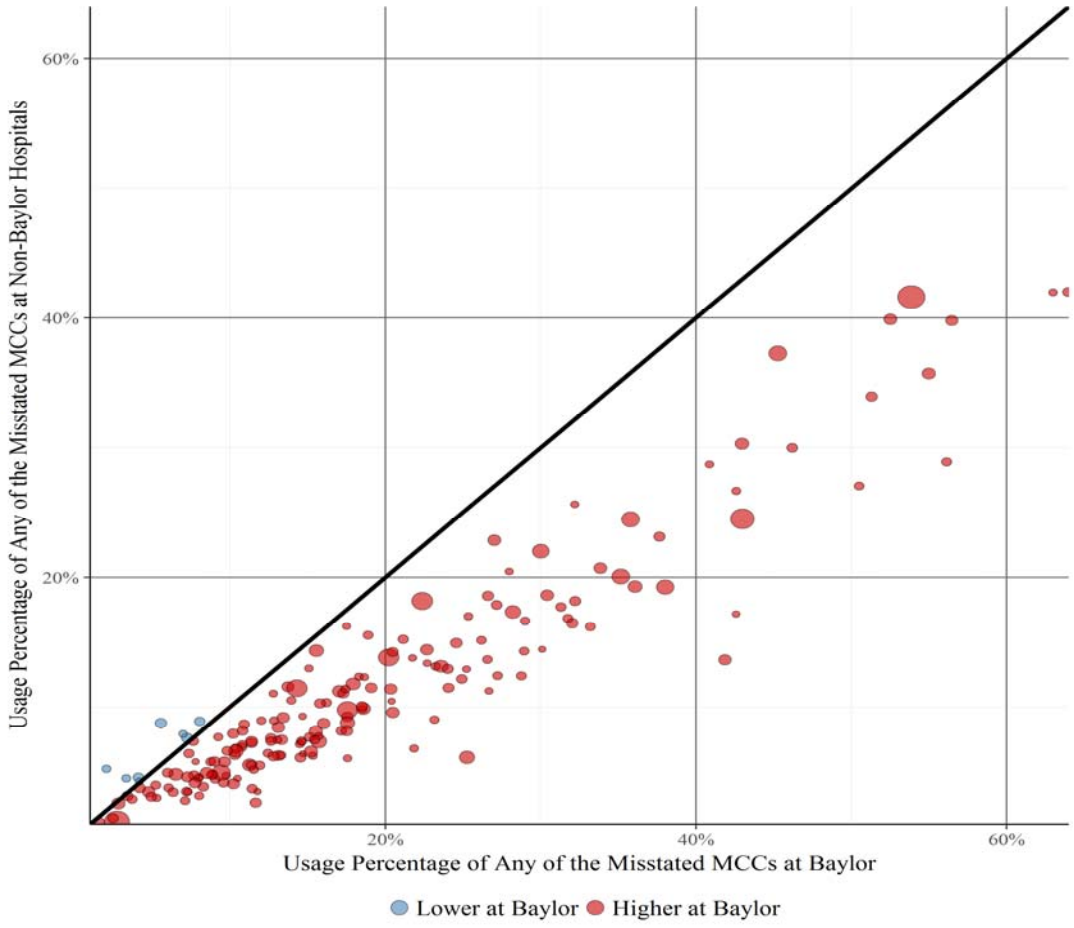
Figure 3. Rate of Misstated MCC Upcoding by Year for Baylor Versus Other Hospitals.
This figure shows the rate at which Baylor is using one of the Misstated MCCs relative to other hospitals over time. This analysis is based on the principal diagnosis codes listed in each section for the specific fraudulent patterns.



48. Figure 4 below shows that Baylor used a higher rate of Misstated MCC codes not just in the principal diagnosis categories analyzed by Relator, but across a large variety of principal diagnosis codes. Specifically, Figure 4 shows a dot for each principal diagnosis category, with the rate of Misstated MCC at Baylor on the x-axis and the rate of Misstated MCC at other non-Baylor hospitals on the y-axis. Dots to the right of the 45-degree line indicate a higher rate of Misstated MCCs at Baylor within that principal diagnosis category than at other non-Baylor hospitals. As the figure shows, Baylor has higher rates of Misstated MCCs across 176 of 184 (95.65%) principal

diagnosis categories. The extent to which Baylor excessively upcoded on the categories identified by Relator was not offset by a relative downcoding for other categories as Baylor consistently upcodes relative to other hospitals across a variety of principal diagnosis codes.

Figure 4. Rate of Misstated MCCs by Principal Diagnosis Code at Baylor Versus Other Hospitals. For the 184 principal diagnoses with at least 100 claims at Baylor (each represented by a dot), this figure compares the rate of Misstated MCCs at Baylor versus non-Baylor hospitals. Red dots to the right of the 45-degree line indicate Baylor is coding the Misstated MCCs higher than average.



A. Encephalopathy

49. The first Misstated MCC fraudulently used by Baylor to make false claims is encephalopathy. The codes included with encephalopathy are listed in Table 1. Encephalopathy is a term for brain disease or damage to the brain where the brain is regarded as "altered in its structure or function." The telltale symptom is an altered mental state, but altered mental state

alone is insufficient for diagnosing encephalopathy. Encephalopathy can be acute or chronic, so the related signs and symptoms can be varied as well. This condition commonly manifests as confusion, agitation, or lethargy, but may include aphasia (altered speech), ataxia (altered gait) and memory loss.

Table 1. List of Encephalopathy ICD-9 and ICD-10 Diagnosis Codes.

ICD-9 Diagnosis Code	Description
34830	Encephalopathy, unspecified
34831	Metabolic encephalopathy
34839	Other encephalopathy
34982	Toxic encephalopathy

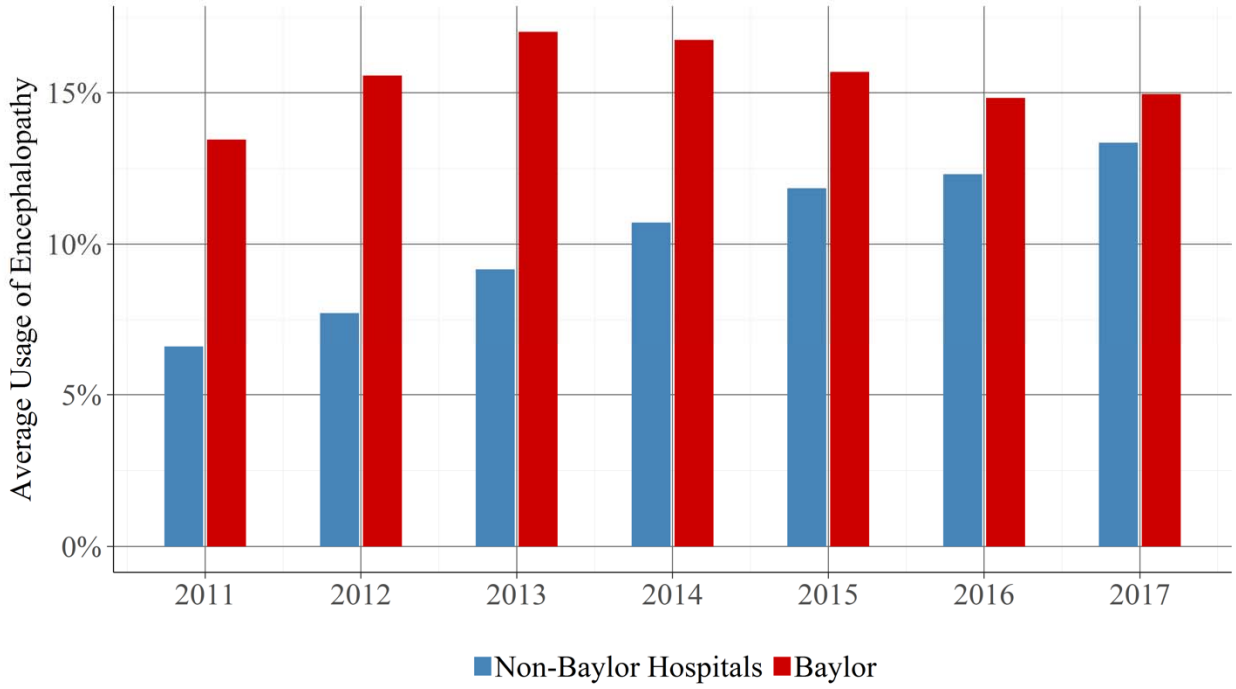
ICD-10 Diagnosis Code	Description
G92	Toxic encephalopathy
G9340	Encephalopathy, unspecified
G9341	Metabolic encephalopathy
G9349	Other encephalopathy
I6783	Posterior reversible encephalopathy syndrome

50. The most common causes of encephalopathy are liver damage, cerebral anoxia (severe lack of oxygen to the brain) or kidney failure. Because the causes are extremely varied, no single lab test can prove the presence of encephalopathy. Therefore, in diagnosing the condition, a medical practitioner must keep multiple considerations in mind. The challenge is to properly identify the root cause of the symptoms observed and eliminate unlikely causes based on objective signs.

51. Encephalopathy is distinguishable from conditions that have similar symptoms. In elderly hospital patients, for instance, temporary instances of lethargy, agitation and confusion are commonly observed, often right after an intense surgery or as the result of a urinary tract infection. These same signs can be observed in patients as “sundowning” or “late-day confusion” in the late afternoon or evening, but these effects are temporary and are actually related to chronic dementia, not encephalopathy.

52. Between 2011 and June 2017, Baylor was 1.54 times more likely to code encephalopathy than other hospitals. During this period, Baylor coded encephalopathy on 15.50 percent of all its claims, compared to 10.10 percent at other hospitals. Baylor's usage of encephalopathy over time, relative to the nationwide average, is shown in Figure 5.

Figure 5. Rate of Encephalopathy by Year for Baylor Versus Other Hospitals.
This figure shows the rate of encephalopathy at Baylor and at other hospitals from 2011 through June 2017, when added to the relevant principal diagnosis codes listed in Table 2.



i. Specific Patterns of Fraud with Encephalopathy

53. Table 2 provides a list of the principal diagnosis codes used by Baylor to upcode with encephalopathy. Relator identified 37 principal diagnosis codes in conjunction with which Baylor coded encephalopathy at a rate at least two times and/or three percentage points higher than the nationwide average. Relator has included only patterns that were statistically significant at the 99.9% level, meaning it is virtually impossible the patterns are due to chance.

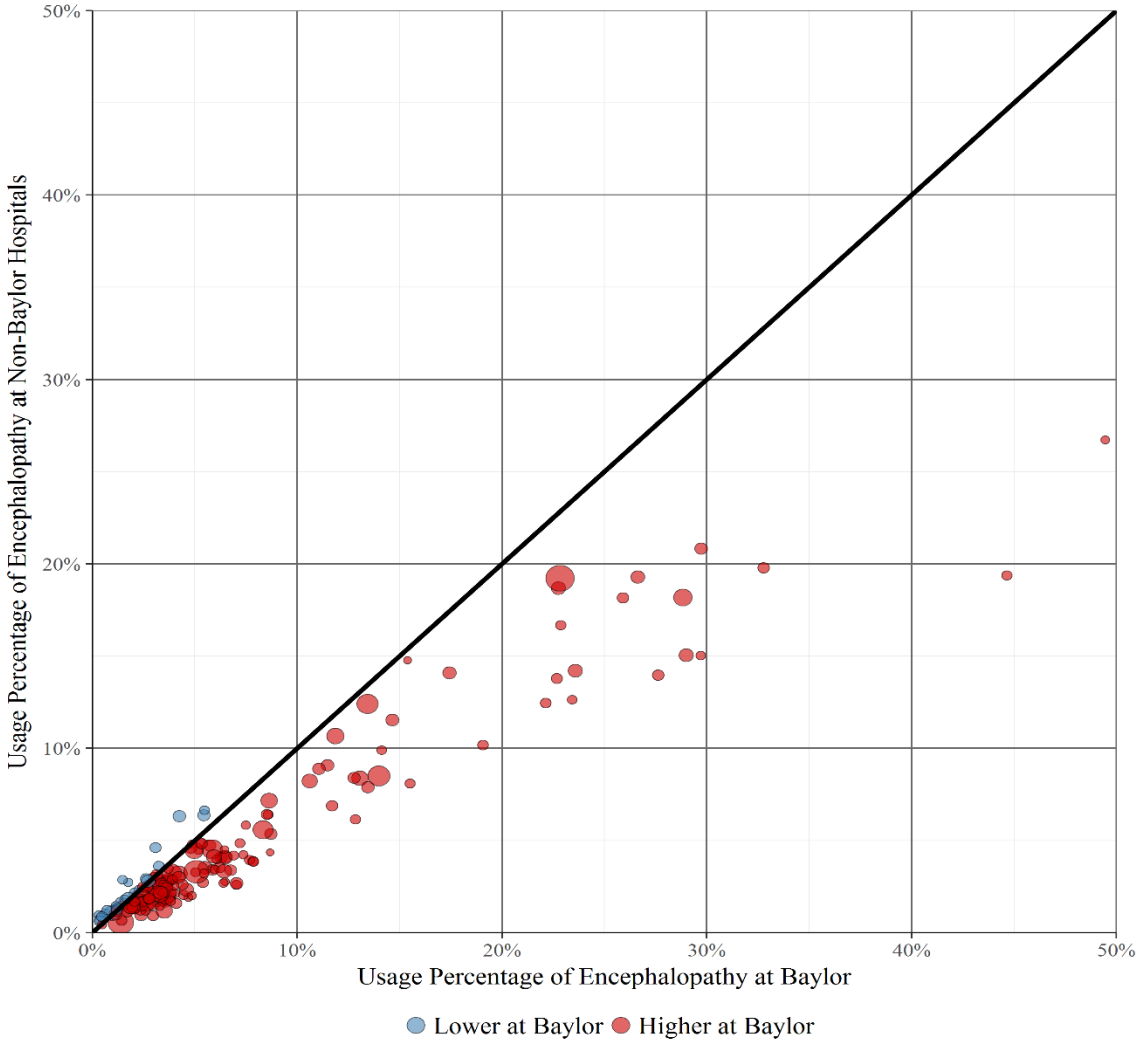
Table 2. Patterns Used by Baylor to Upcode with Encephalopathy.
The following table lists the principal diagnosis categories in which Baylor excessively upcodes with encephalopathy. 1 principal diagnosis category with fewer than 11 fraudulent claims at Baylor has been omitted from the table.

Principal Diagnosis	% with MCC at Other Hospitals	% with MCC at Baylor	Baylor Rate Relative to Nationwide Average	Num. of Fraud Claims at Baylor
Unspecified Septicemia	19.21%	22.83%	119%	399
Urinary Tract Infection; Site Not Specified	18.17%	28.82%	159%	347
Occlusion of Cerebral Arteries	8.50%	14.00%	165%	301
Epilepsy	15.04%	29.00%	193%	180
Intracranial Hemorrhage	14.20%	23.58%	166%	119
Other Intracranial Injury	8.37%	13.06%	156%	97
Substance-related Disorders	19.36%	44.66%	231%	90
Other Gram Negative Septicemia	19.29%	26.63%	138%	81
Cystitis and Urethritis	13.97%	27.62%	198%	74
Staphylococcal Septicemia	20.81%	29.72%	143%	71
Poisoning by Other Medications and Drugs	19.79%	32.77%	166%	69
Osteoarthritis; Localized	0.56%	1.38%	247%	68
E. Coli Septicemia	18.68%	22.75%	122%	54
Other Diseases of the Circulatory System	3.32%	6.43%	194%	50
Coronary Atherosclerosis	1.18%	3.50%	298%	49
Streptococcal Septicemia	18.16%	25.90%	143%	45
Other Endocrine Disorders	13.78%	22.68%	165%	43
Other Diseases of the Nervous System and Sense Organs	7.87%	13.45%	171%	43
Poisoning by Psychotropic Agents	26.71%	49.47%	185%	43
Convulsions	12.45%	22.14%	178%	37
Nonrheumatic Aortic Valve Disorders	2.67%	7.04%	264%	37
Secondary Malignancy of Brain/spine	10.17%	19.06%	187%	36
Delirium Dementia and Amnestic and Other Cognitive Disorders	15.02%	29.71%	198%	35
Other Fluid and Electrolyte Disorders	8.40%	12.77%	152%	31
Disorders of Mineral Metabolism	12.62%	23.44%	186%	28
Alcohol-related Disorders	6.89%	11.69%	170%	27
Other Endocrine; Nutritional; and Metabolic Diseases and Immunity Disorders	5.35%	8.70%	163%	24
Other and Unspecified Hereditary and Degenerative Nervous Conditions	8.09%	15.51%	192%	23
Other Injuries and Conditions Due to External Causes	6.14%	12.84%	209%	22

Principal Diagnosis	% with MCC at Other Hospitals	% with MCC at Baylor	Baylor Rate Relative to Nationwide Average	Num. of Fraud Claims at Baylor
Infective Arthritis and Osteomyelitis (except that Caused by TB or STD)	3.39%	6.75%	199%	21
Diabetes with Circulatory Manifestations	3.88%	7.82%	201%	16
Another Aneurysm	3.84%	7.86%	205%	15
Spinal Stenosis; Lumbar Region	1.68%	3.54%	211%	15
Fracture of Tibia and Fibula	2.60%	7.03%	270%	14
Chemotherapy	0.98%	2.38%	243%	14
Other Bone Disease and Musculoskeletal Deformities	1.58%	4.09%	259%	12

54. Figure 6 below shows that Baylor not only used a higher rate of encephalopathy in the few categories listed above, but also across a large variety of principal diagnosis codes. The red dots to the right of the 45-degree line indicate higher rates of encephalopathy at Baylor versus the nationwide average. This figure shows that Baylor has a higher rate of encephalopathy for 160 out of 184 (86.96%) principal diagnosis categories. In other words, the extent to which Baylor excessively upcoded encephalopathy on the categories listed in Table 2 above was not offset by relative downcoding in other principal diagnosis categories.

Figure 6. Rate of Encephalopathy by Principal Diagnosis Code at Baylor Versus Other Hospitals. For the 184 principal diagnoses with at least 100 claims at Baylor (each represented by a dot), this figure compares the rate of encephalopathy at Baylor versus non-Baylor hospitals. Red dots to the right of the 45-degree line indicate Baylor is coding encephalopathy at a rate higher than the nationwide average.

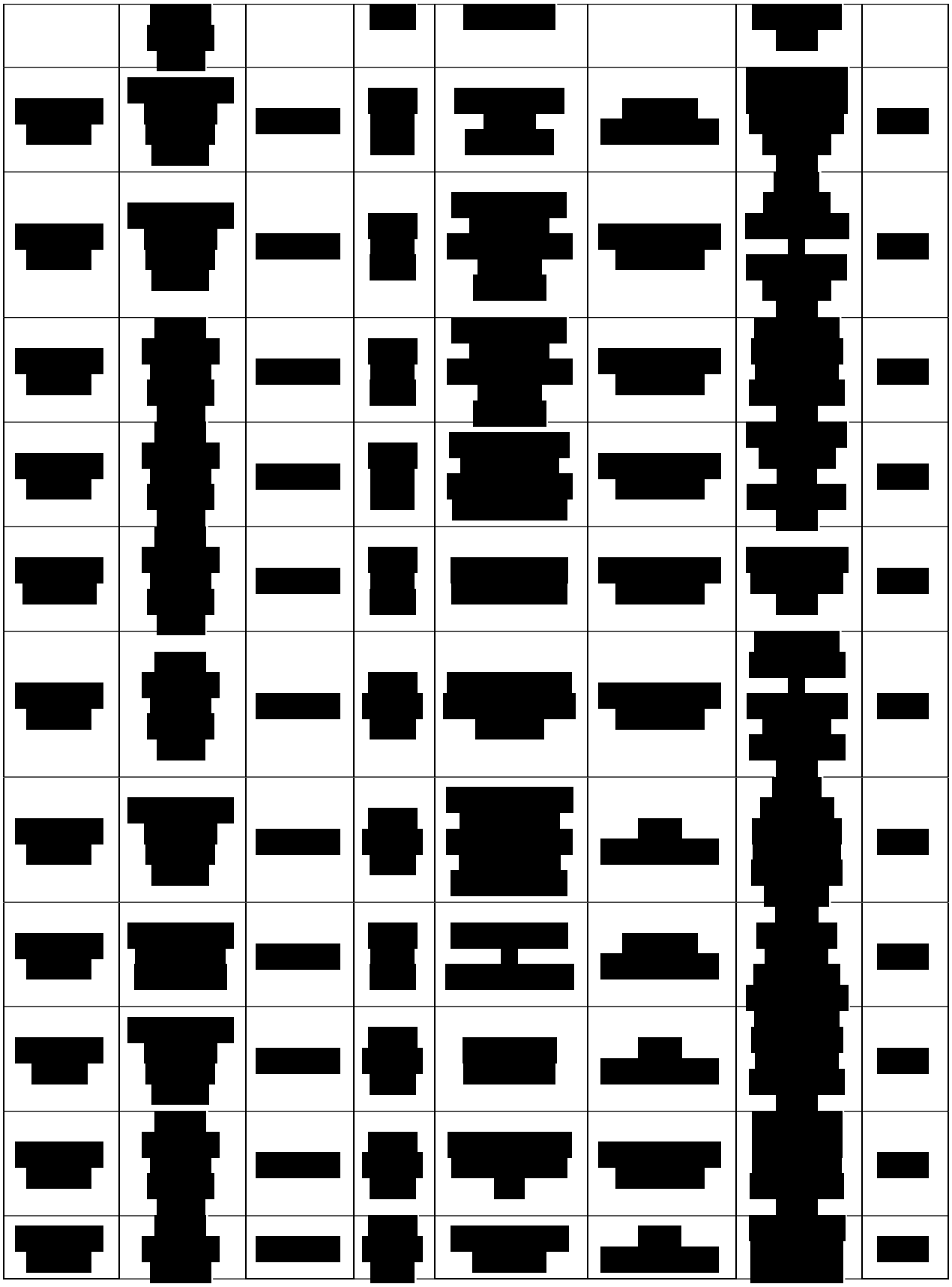


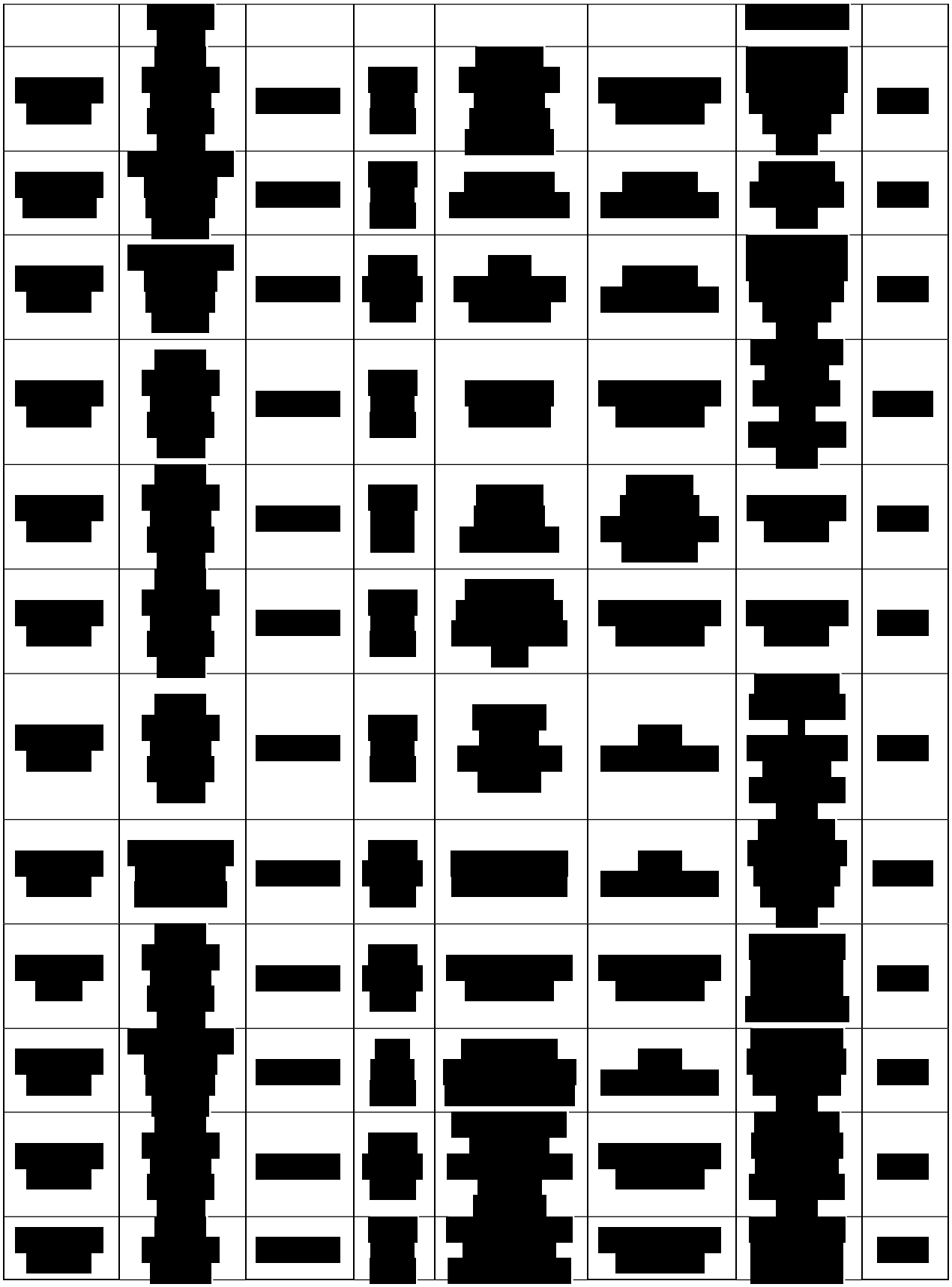
ii. Specific False Claims with Encephalopathy

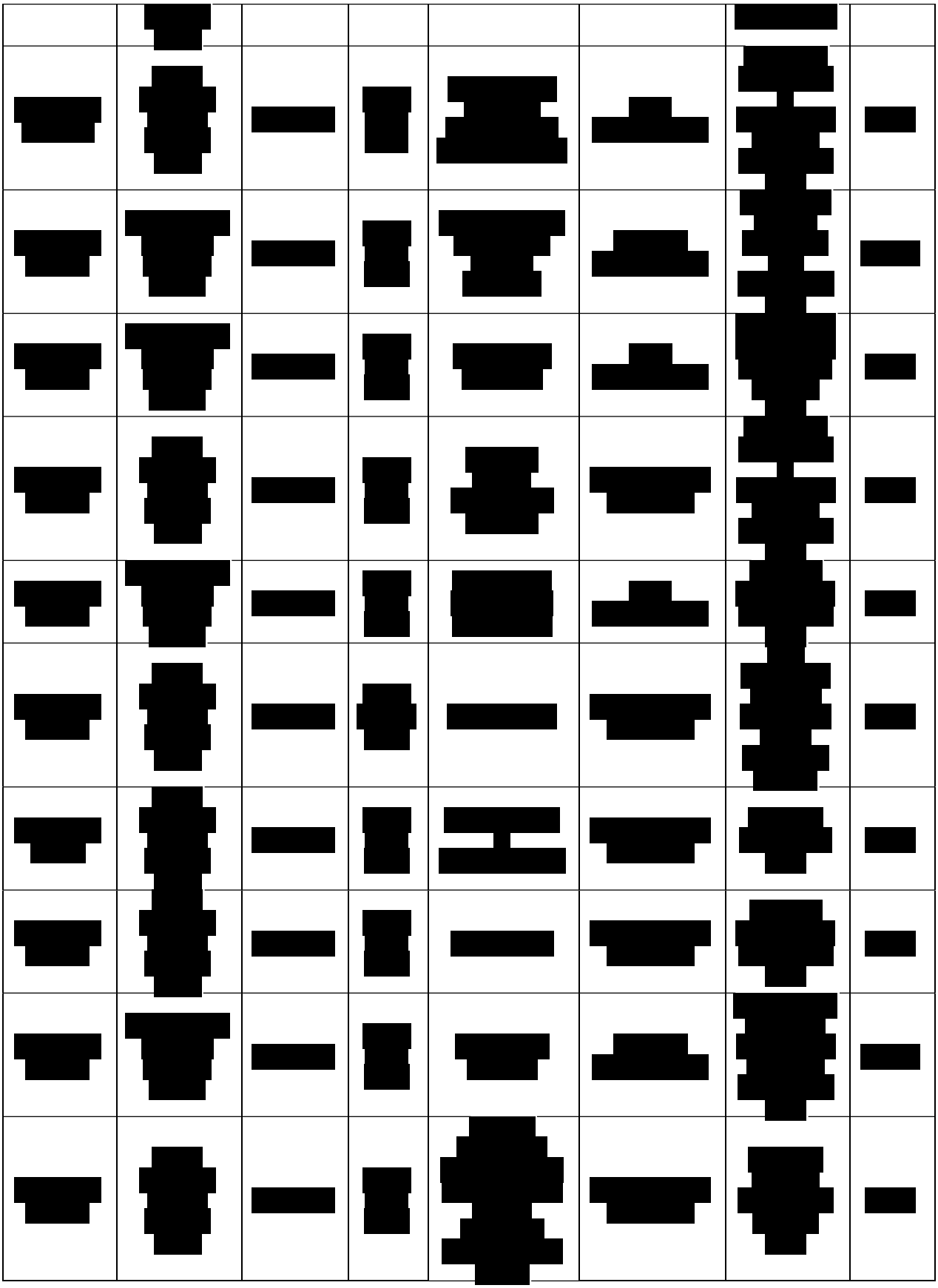
55. The Relator has identified many specific false Medicare claims submitted by Baylor involving encephalopathy. The following table includes 50 examples.

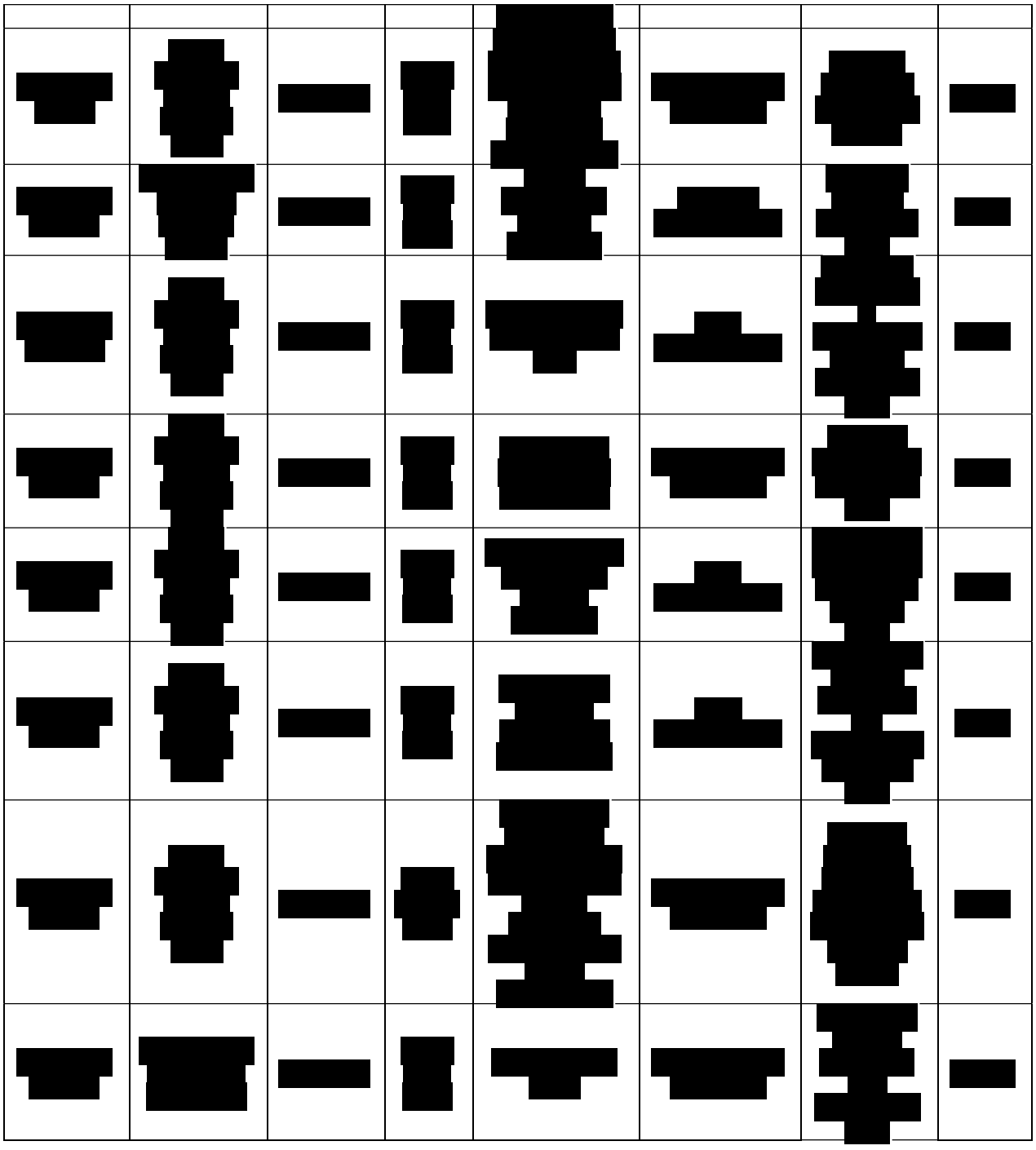
Table 3. False Claims made by Baylor Using Encephalopathy.
The following table presents specific examples of false claims made by Baylor using encephalopathy. The first six digits of the beneficiary ID has been removed to make it harder to identify the individual patients.

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]							









B. Respiratory Failure

56. The second Misstated MCC that Baylor used at an excessive rate is respiratory failure, which includes pulmonary insufficiency. The codes classified as respiratory failure are listed in Table 4 below. Respiratory failure is a syndrome characterized by poor gas transfer in the

lungs at the alveolar and capillary levels as a result of a problem making it difficult to breathe. It can be acute or chronic. There are two types: the first and most common is hypoxemia ("oxygenation failure"), and the second type demonstrates both hypoxemia and hypercapnia ("ventilatory failure"). Respiratory failure can be acute and life-threatening, or chronic and manageable with modifications.

Table 4. List of Respiratory Failure ICD-9 and ICD-10 Diagnosis Codes.

ICD-9 Diagnosis Code	Description
5184	Acute edema of lung, unspecified
5185	Pulmonary insufficiency following trauma and surgery
51851	Acute respiratory failure following trauma and surgery
51852	Other pulmonary insufficiency not elsewhere classified following trauma/surgery
51853	Acute and chronic respiratory failure following trauma and surgery
51881	Acute respiratory failure
51884	Acute and chronic respiratory failure

ICD-10 Diagnosis Code	Description
J810	Acute pulmonary edema
J951	Acute pulmonary insufficiency following thoracic surgery
J952	Acute pulmonary insufficiency following nonthoracic surgery
J953	Chronic pulmonary insufficiency following surgery
J95821	Acute postprocedural respiratory failure
J95822	Acute and chronic postprocedural respiratory failure
J9600	Acute respiratory failure, unspecified whether with hypoxia or hypercapnia
J9601	Acute respiratory failure with hypoxia
J9602	Acute respiratory failure with hypercapnia
J9620	Acute and chronic respiratory failure, unspecified whether with hypoxia or hypercapnia
J9621	Acute and chronic respiratory failure with hypoxia
J9622	Acute and chronic respiratory failure with hypercapnia
J9690	Respiratory failure, unspecified, unspecified whether with hypoxia or hypercapnia
J9691	Respiratory failure, unspecified with hypoxia
J9692	Respiratory failure, unspecified with hypercapnia

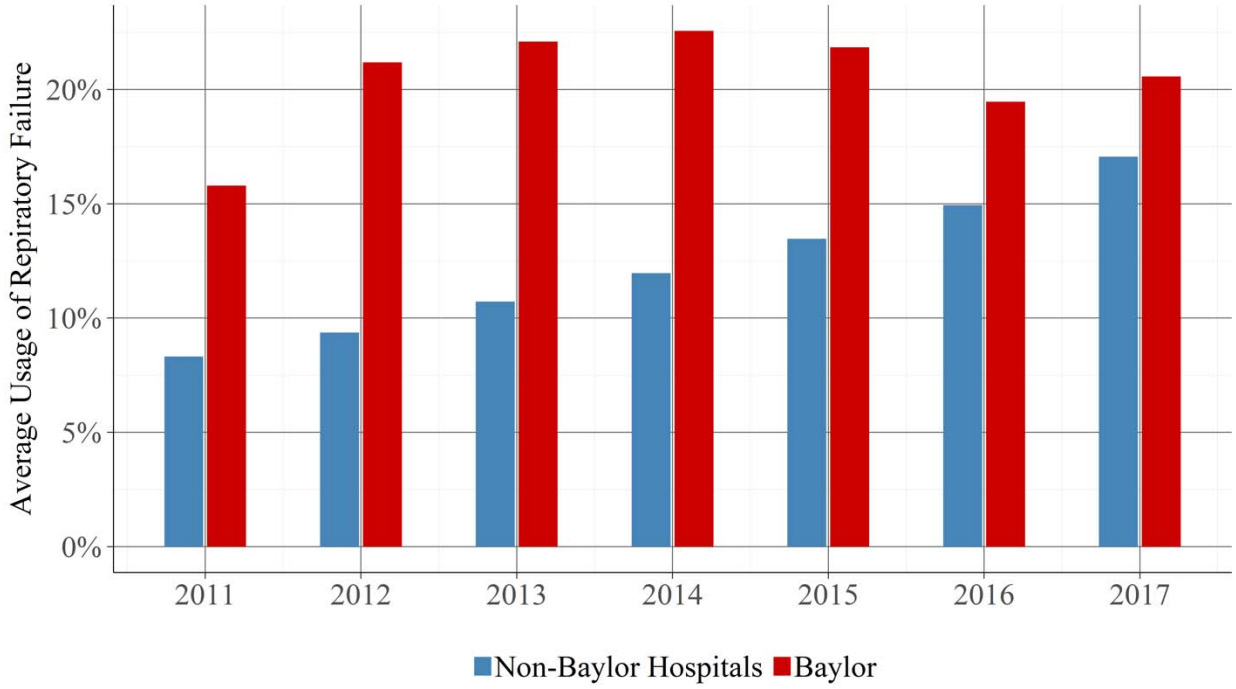
57. The possible root causes are myriad, and may include poor circulation, neuromuscular disease, chronic bronchitis, COPD, obesity or drug use, an obstructing object, or an injury to the brain or spinal cord. The signs and symptoms are bluish skin, shortness of breath, labored breathing and feeling unable to get enough air. The patient may also become very sleepy, lose consciousness, be confused, or have arrhythmia. After listening to the patient's heartbeat and

lungs, a pulse oximetry test, an arterial blood gas test from a blood draw, and a chest x-ray can together help determine a proper diagnosis.

58. Respiratory failure is distinguishable from conditions that have similar symptoms. Elderly patients, for example, frequently breathe shallowly during sleep. Chronic conditions such as structural and neuromuscular issues can lead to slow decline in breathing quality. Also, elderly patients who have recently undergone surgery may experience symptoms that are similar to those of respiratory failure. Though they may necessitate mechanical oxygenation assistance, it is unlikely that these conditions are sufficient for an acute respiratory failure diagnosis.

59. As shown in Figure 7, Baylor coded at a significantly higher rate of respiratory failure than other hospitals. From 2011 through June 2017, across the relevant codes, Baylor coded respiratory failure at 1.73 times the rate at other hospitals, using it on 20.54 percent of claims, versus 11.87 percent at other hospitals. Baylor's rate of respiratory failure increases again in 2017.

Figure 7. Rate of Respiratory Failure by Year for Baylor Versus Other Hospitals.
This figure shows the rate of respiratory failure at Baylor and at other hospitals from 2011 through June 2017, when added to the suspicious principal diagnosis codes listed in Table 5 below.



i. Specific Patterns of Fraud with Respiratory Failure

60. The following table provides a list of the principal diagnosis codes used by Baylor to upcode with respiratory failure. Relator identified 56 principal diagnosis codes in conjunction with which Baylor coded respiratory failure at a rate at least two times and/or three percentage points higher than the nationwide average. Only patterns that were statistically significant at the 99.9% level, meaning virtually impossible to be due to chance, are included.

Table 5. Patterns Used by Baylor to Upcode with Respiratory Failure.
The following table lists the principal diagnosis categories in which Baylor excessively upcodes with respiratory failure. One principal diagnosis category with fewer than 11 fraudulent claims at Baylor has been omitted from the table.

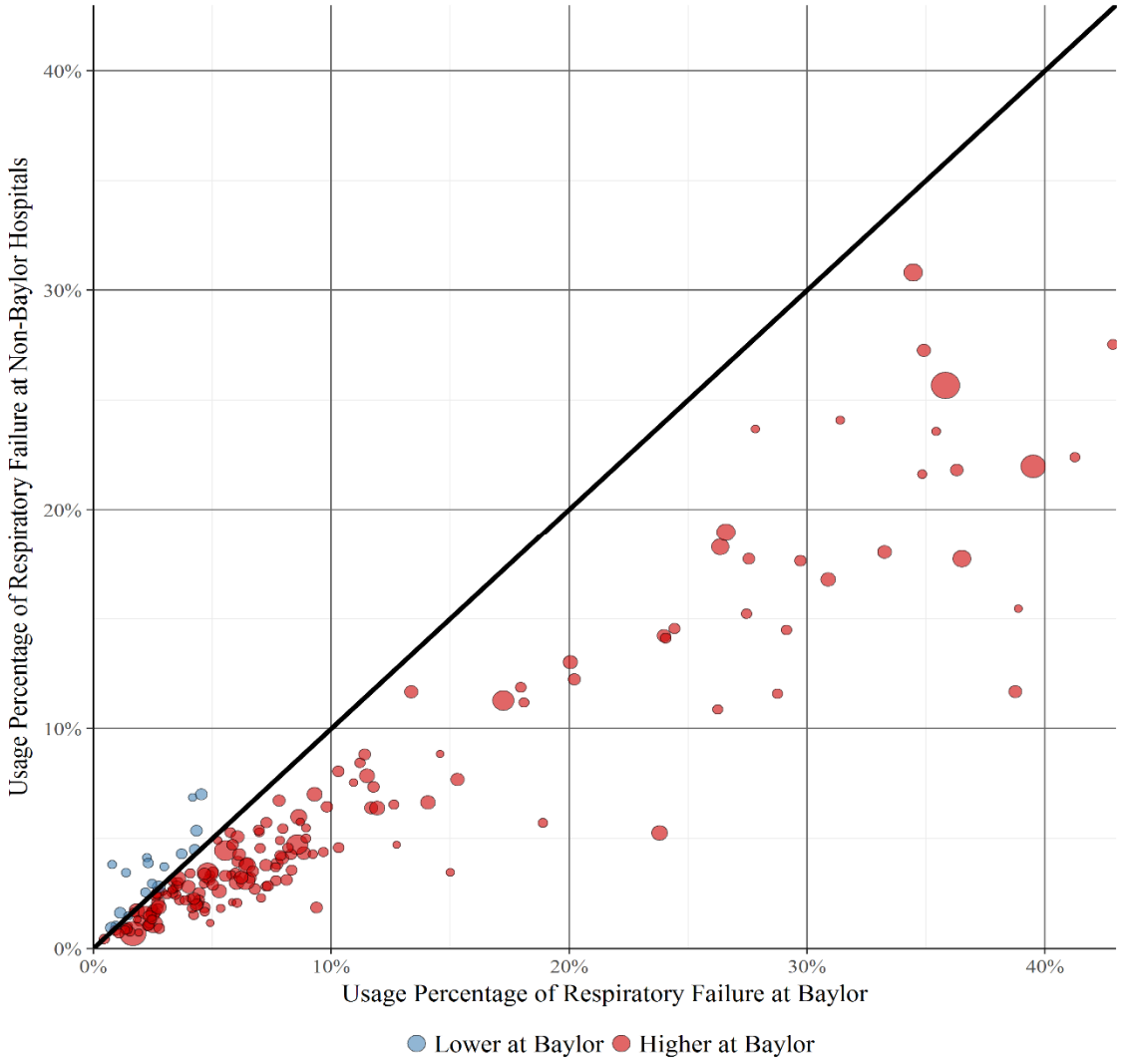
Principal Diagnosis	% with MCC in Other Hospitals	% with MCC in Baylor	Baylor Rate Relative to Other Hospitals	Num. of Fraud Claims at Baylor
Congestive Heart Failure; Nonhypertensive	21.97%	39.51%	180%	835
Unspecified Septicemia	25.66%	35.82%	140%	725
Obstructive Chronic Bronchitis	17.73%	36.51%	206%	363
Coronary Atherosclerosis	5.24%	23.81%	454%	230
Acute Myocardial Infarction	11.27%	17.24%	153%	193
Pneumonia; Organism Unspecified	18.97%	26.58%	140%	159
Nonrheumatic Aortic Valve Disorders	11.68%	38.75%	332%	156
Hypertensive Heart and/or Renal Disease	18.27%	26.35%	144%	133
Pulmonary Heart Disease	16.78%	30.88%	184%	130
Fracture of Neck of Femur (hip)	4.72%	8.57%	182%	123
Other Gram Negative Septicemia	18.04%	33.25%	184%	118
Staphylococcal Septicemia	21.81%	36.30%	166%	78
Other Bacterial Pneumonia	30.81%	34.45%	112%	76
Atrial Fibrillation	3.07%	6.40%	208%	73
Other Diseases of the Circulatory System	6.65%	14.07%	212%	67
Cancer of Bronchus; Lung	14.22%	23.99%	169%	65
E. Coli Septicemia	13.02%	20.05%	154%	61
Other Neoplasms	6.38%	11.94%	187%	58
Osteoarthritis; Localized	0.67%	1.67%	249%	56
Epilepsy	7.69%	15.31%	199%	54
Aspiration Pneumonitis; Food/vomitus	27.25%	34.91%	128%	52
Other Specified Septicemia	27.54%	42.86%	156%	43
Streptococcal Septicemia	17.73%	27.55%	155%	41
Influenza	17.64%	29.71%	168%	41
Other Pneumonia	22.40%	41.26%	184%	39
Chronic Obstructive Asthma with Acute Exacerbation	11.59%	28.77%	248%	38
Other Diseases of the Respiratory System	12.24%	20.22%	165%	37

Principal Diagnosis	% with MCC in Other Hospitals	% with MCC in Baylor	Baylor Rate Relative to Other Hospitals	Num. of Fraud Claims at Baylor
Other Central Nervous System Disorders	7.85%	11.51%	147%	36
Other Injury and Poisoning	4.35%	8.85%	203%	35
Other Aneurysm	14.48%	29.13%	201%	34
Sickle Cell Anemia	1.86%	9.38%	505%	33
Malfunction of Device; Implant; and Graft	2.98%	6.02%	202%	32
Other Complications of Surgical and Medical Procedures	6.40%	11.67%	182%	32
Congestive Heart Failure	10.87%	26.24%	241%	31
Poisoning by Other Medications and Drugs	14.55%	24.42%	168%	30
Substance-related Disorders	15.22%	27.46%	180%	30
Urinary Tract Infection; Site Not Specified	1.11%	2.51%	226%	28
Pleurisy; Pleural Effusion	14.12%	24.05%	170%	26
Nonrheumatic Mitral Valve Disorders	15.45%	38.89%	252%	25
Diabetes with Other Manifestations	2.61%	5.29%	203%	25
Fracture of Vertebral Column without Mention of Spinal Cord Injury	4.11%	7.93%	193%	22
Disorders of the Peripheral Nervous System	5.70%	18.90%	331%	22
Empyema and Pneumothorax	21.62%	34.84%	161%	20
Pathological Fracture	3.87%	7.72%	200%	18
Other Endocrine; Nutritional; and Metabolic Diseases and Immunity Disorders	3.13%	8.11%	259%	18
Other Complications of Internal Prosthetic Device; Implant; and Graft	3.78%	7.25%	192%	18
Unstable Angina (Intermediate Coronary Syndrome)	4.58%	10.31%	225%	17
Fracture of Pelvis	2.71%	6.79%	250%	16
Other Diseases of the Nervous System and Sense Organs	3.20%	6.61%	206%	15
Other Endocrine Disorders	2.84%	7.35%	259%	14
Secondary Malignancy of Bone	3.46%	15.00%	433%	14
Diabetes with Circulatory Manifestations	3.08%	7.66%	248%	13
Other Cardiac Dysrhythmias	1.96%	4.32%	220%	12
Hemorrhage or Hematoma Complicating a Procedure	3.57%	8.33%	233%	12
Cancer of Pancreas	4.38%	9.66%	220%	11

61. Figure 8 below shows that Baylor used a higher rate of respiratory failure not just in the few categories listed above, but across a large variety of principal diagnosis codes. The red dots to the right of the 45-degree line indicate higher rates of respiratory failure at Baylor versus

the nationwide average. This figure shows that Baylor has a higher rate of respiratory failure for 167 out of 184 (90.76%) principal diagnosis categories. In other words, the extent to which Baylor excessively upcoded respiratory failure on the categories listed in Table 5 above was not offset by relative downcoding in other principal diagnosis categories.

Figure 8. Rate of Respiratory Failure by Principal Diagnosis Code at Baylor Versus Other Hospitals. For the 184 principal diagnoses with at least 100 claims at Baylor (each represented by a dot), this figure compares the rate of respiratory failure at Baylor versus non-Baylor hospitals. Red dots to the right of the 45-degree line indicate Baylor is coding respiratory failure at a rate higher than the nationwide average.



ii. Specific False Claims with Respiratory Failure

62. The Relator has identified many specific false Medicare claims submitted by Baylor involving respiratory failure. The following table includes 50 examples.

Table 6. False Claims made by Baylor to Using Respiratory Failure.
The following table presents specific examples of false claims made by Baylor using respiratory failure. The first six digits of the beneficiary ID has been removed to make it harder to identify the individual patients.

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]							
[redacted]							
[redacted]							
[redacted]							
[redacted]							
[redacted]							
[redacted]							
[redacted]							

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

C. Severe Malnutrition

63. The final Misstated MCC that Baylor used to commit fraud at a higher rate was severe malnutrition. There are three severe malnutrition codes, listed in Table 7, that are considered MCCs. Severe protein-calorie malnutrition in the elderly is a disorder of extreme lack of nutrition involving the highest level of protein-energy malnutrition and protein-calorie malnutrition. Another rare form, Kwashiorkor malnutrition, is common in Sub-Saharan Africa, and is unlikely to be present in the elderly in the United States. Nutritional marasmus is caused by insufficient nutrients and is most common in children. In the elderly, malnourishment can manifest for a variety of reasons including anorexia, dehydration, and malabsorption.

Table 7. List of Severe Malnutrition ICD-9 and ICD-10 Diagnosis Codes.

ICD-9 Diagnosis Code	Description
260	Kwashiorkor
261	Nutritional Marasmus
262	Other Severe Protein-Calorie Malnutrition

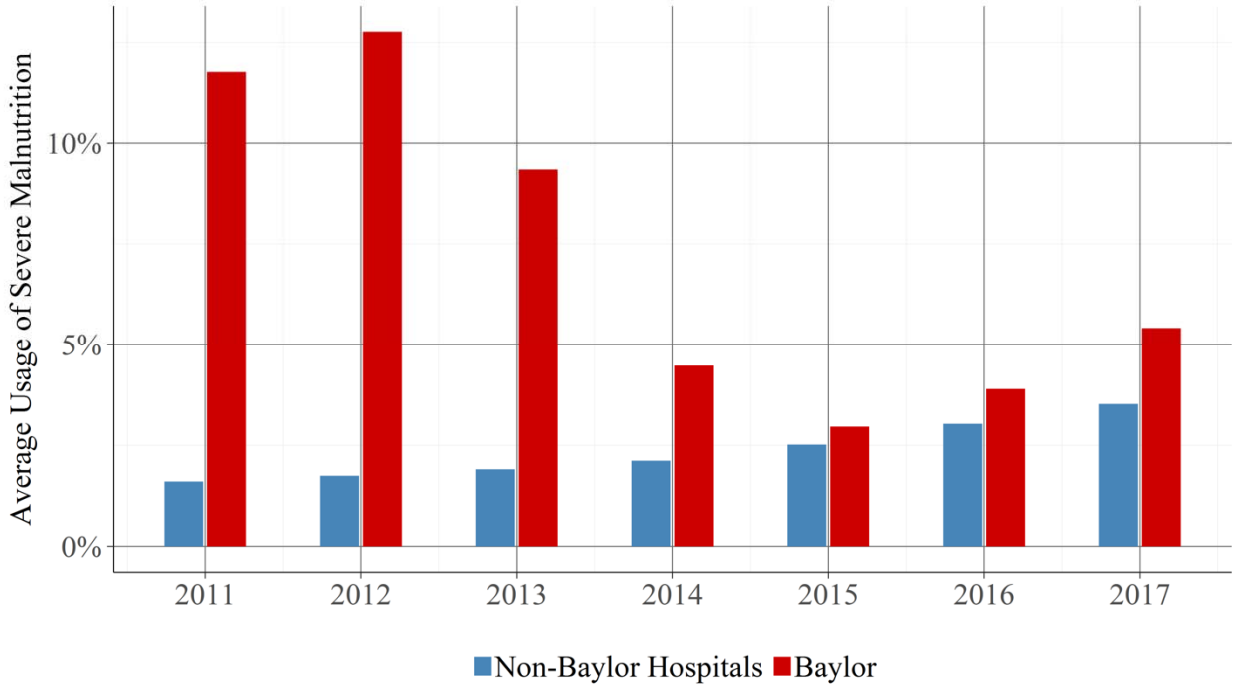
ICD-10 Diagnosis Code	Description
E40	Kwashiorkor
E41	Nutritional marasmus
E42	Marasmic kwashiorkor
E43	Unspecified severe protein-calorie malnutrition

64. Patients may initially present malnutrition signs to a healthcare provider, but the patient may simply be underweight (and may not need to be coded as malnutrition at all), or the condition may not be severe. If so, other codes are available for malnutrition of a moderate degree (ICD-9 code 2630) and other protein-calorie malnutrition (ICD-9 code 2638). Kwashiorkor malnutrition has been overdiagnosed in the past and is now usually contra-indicated in American elderly.[13] Additionally, interventions for malnutrition can often be used that supply calories and ameliorate the issue at a low cost, alleviating the need for tremendous resources associated with MCC codes. Furthermore, certain emergency measures are now considered overused and often unhelpful.

65. As shown in Figure 9, Baylor coded a significantly higher rate of severe malnutrition than other hospitals. The rate was highest during the time Anthony Matejicka worked at Baylor and is increasing again in 2017. From 2011 through June 2017, hospitals nationwide used severe malnutrition on 2.26 percent of claims, while Baylor used it on 7.07 percent of claims—or 3.14 times as often.

[13] California Watch, *Prime Healthcare Reports Outsized Rates of Unusual Conditions*, *available at* https://goo.gl/9G8MW4 (last accessed Apr. 17, 2018). Dep't of Health and Human Servs., *Rex Hospital Incorrectly Billed Medicare Inpatient Claims with Kwashiorkor*, *available at* https://goo.gl/RbEWY7 (last accessed Apr. 17, 2018). HCPro, *News: OIG Fines Another Facility for Inappropriate Kwashiorkor Claims*, *available at* https://goo.gl/chCT3c (last accessed Apr. 17, 2018).

Figure 9. Rate of Severe Malnutrition by Year for Baylor Versus Other Hospitals.
This figure shows the rate of severe malnutrition at Baylor and at other hospitals from 2011 through June 2017, when added to the suspicious principal diagnosis codes listed in Table 8 below.



i. Specific Patterns of Fraud with Severe Malnutrition

66. The following table provides a list of the principal diagnosis codes used by Baylor to upcode with severe malnutrition. Relator identified 116 principal diagnosis codes in conjunction with which Baylor coded severe malnutrition at a rate at least two times and/or at three percentage points higher than the nationwide average. Only patterns that were statistically significant at the 99.9% level, meaning virtually impossible to be due to chance, are included.

Table 8. Patterns Used by Baylor to Upcode with Severe Malnutrition.
The following table lists the principal diagnosis categories in which Baylor excessively upcodes with severe malnutrition. 22 principal diagnosis categories with fewer than 11 fraudulent claims at Baylor have been omitted from the table.

Principal Diagnosis Code	% with MCC Code in Other Hospitals	% with MCC Code at Baylor	Baylor Rate Relative to Other Hospitals	Num. of Fraud Claims at Baylor
Unspecified Septicemia	5.68%	13.99%	246%	594
Fracture of Neck of Femur (hip)	1.61%	5.72%	355%	132
Acute Renal Failure	3.28%	6.97%	212%	122
Congestive Heart Failure; Nonhypertensive	1.18%	3.74%	316%	122

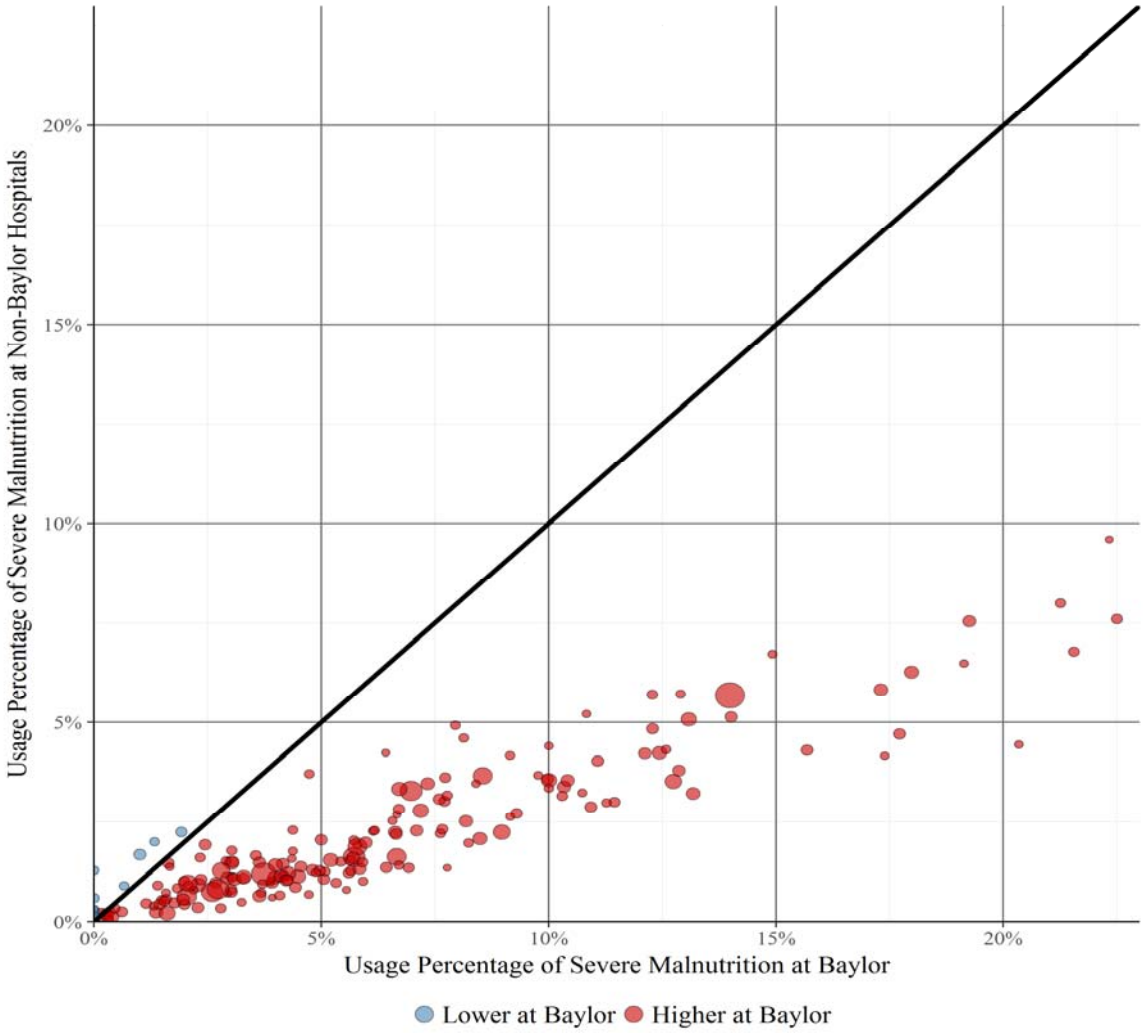
Principal Diagnosis Code	% with MCC Code in Other Hospitals	% with MCC Code at Baylor	Baylor Rate Relative to Other Hospitals	Num. of Fraud Claims at Baylor
Infection and Inflammation--Internal Prosthetic Device; Implant; and Graft	3.52%	12.74%	362%	119
Other Bacterial Pneumonia	3.66%	8.55%	234%	102
Urinary Tract Infection; Site Not Specified	1.62%	6.66%	411%	102
Other Diseases of the Digestive System	2.24%	8.97%	401%	100
Other Gram Negative Septicemia	6.27%	17.98%	287%	91
Other Neoplasms	5.07%	13.09%	258%	84
Pneumonia; Organism Unspecified	1.87%	5.79%	309%	82
Aspiration Pneumonitis; Food/vomitus	5.82%	17.31%	297%	78
E. Coli Septicemia	4.23%	12.44%	294%	71
Postoperative Infection	3.21%	13.18%	410%	71
Intestinal Infection	3.55%	10.01%	282%	66
Staphylococcal Septicemia	7.53%	19.26%	256%	63
Occlusion of Cerebral Arteries	0.81%	2.73%	338%	62
Acute Myocardial Infarction	0.74%	2.60%	352%	60
Other Intestinal Obstruction	2.78%	7.19%	258%	51
Acute Pancreatitis	2.08%	8.49%	408%	51
Peritoneal or Intestinal Adhesions	4.71%	17.71%	376%	46
Other Specified Septicemia	7.59%	22.50%	296%	42
Other Complications of Surgical and Medical Procedures	3.39%	10.33%	305%	42
Other and Unspecified Gastrointestinal Disorders	3.55%	10.41%	294%	42
Other Disorders of Stomach and Duodenum	3.80%	12.86%	339%	41
Other Infectious and Parasitic Diseases	4.30%	15.69%	365%	41
Cancer of Colon	4.22%	12.12%	287%	38
Streptococcal Septicemia	5.13%	14.01%	273%	37
Malfunction of Device; Implant; and Graft	1.13%	4.49%	399%	35
Hemorrhage from Gastrointestinal Ulcer	2.52%	8.18%	325%	35
Other Secondary Malignancy	6.77%	21.55%	318%	34
Pulmonary Heart Disease	1.53%	5.20%	339%	34
Other Central Nervous System Disorders	3.32%	6.72%	202%	33
Other Intracranial Injury	1.20%	4.27%	355%	32
Atrial Fibrillation	0.62%	2.04%	330%	31
Hyposmolality	2.23%	6.63%	297%	30
Other Peripheral and Visceral Atherosclerosis	2.88%	10.92%	379%	29
Cancer of Pancreas	7.99%	21.26%	266%	27
Other Endocrine; Nutritional; and Metabolic Diseases and Immunity Disorders	4.03%	11.08%	275%	26
Cancer of Bronchus; Lung	3.46%	7.35%	212%	26
Liver Abscess and Sequelae of Chronic Liver Disease	4.84%	12.28%	254%	25
Hypertensive Heart and/or Renal Disease	1.27%	2.80%	220%	25

Principal Diagnosis Code	% with MCC Code in Other Hospitals	% with MCC Code at Baylor	Baylor Rate Relative to Other Hospitals	Num. of Fraud Claims at Baylor
Other Venous Embolism and Thrombosis	1.32%	5.85%	444%	25
Pathological Fracture	2.27%	7.10%	312%	23
Hypovolemia	3.58%	9.97%	278%	23
Other Injury and Poisoning	1.10%	3.97%	362%	22
Pleurisy; Pleural Effusion	3.00%	11.45%	382%	22
Obstructive Chronic Bronchitis	0.96%	2.07%	216%	21
Hemorrhage of Gastrointestinal Tract	1.97%	5.98%	303%	21
Melena	1.59%	5.71%	358%	21
Intracranial Hemorrhage	1.13%	4.11%	365%	20
Other Diseases of the Circulatory System	1.11%	3.30%	296%	20
Alcohol-related Disorders	2.71%	9.30%	343%	20
Diverticulitis	1.42%	3.99%	282%	19
Other Fluid and Electrolyte Disorders	3.07%	7.60%	247%	19
Acute Posthemorrhagic Anemia	2.18%	6.65%	305%	19
Respiratory Failure	4.44%	20.34%	458%	19
Diverticulosis	1.03%	4.23%	412%	18
Calculus of Bile Duct	1.36%	6.42%	474%	18
Coronary Atherosclerosis	0.21%	1.61%	758%	17
Nonrheumatic Aortic Valve Disorders	0.64%	3.63%	568%	17
Diseases of White Blood Cells	3.15%	10.30%	327%	17
Noninfectious Gastroenteritis	1.34%	6.92%	516%	16
Other Connective Tissue Disease	1.29%	4.80%	373%	16
Infective Arthritis and Osteomyelitis (except That Caused by TB or STD)	3.02%	7.72%	256%	16
Other and Unspecified Liver Disorders	4.16%	17.39%	418%	15
Diabetes with Ketoacidosis or Uncontrolled Diabetes	1.43%	4.16%	291%	15
Other Complications of Internal Prosthetic Device; Implant; and Graft	0.98%	3.92%	401%	15
Gastrointestinal Complications	5.70%	12.28%	216%	15
Diabetes with Circulatory Manifestations	2.31%	7.66%	331%	15
Cancer of Other GI Organs; Peritoneum	6.49%	19.13%	295%	15
Epilepsy	1.05%	3.09%	294%	15
Cellulitis and Abscess of Leg	0.92%	2.30%	251%	14
Diabetes with Other Manifestations	1.47%	3.02%	205%	14
Infections of Kidney	1.07%	5.06%	474%	14
Other Diseases of the Nervous System and Sense Organs	1.37%	4.56%	332%	14
Poisoning by Other Medications and Drugs	1.21%	5.61%	463%	13
Decubitus Ulcer	9.61%	22.33%	232%	13
Aplastic Anemia	4.32%	12.58%	291%	12
Other Endocrine Disorders	2.82%	6.71%	238%	12
Atherosclerosis of Arteries of Extremities	0.86%	4.42%	516%	12
Other Nervous System Symptoms and Disorders	2.04%	5.00%	246%	12

Principal Diagnosis Code	% with MCC Code in Other Hospitals	% with MCC Code at Baylor	Baylor Rate Relative to Other Hospitals	Num. of Fraud Claims at Baylor
Other Biliary Tract Disease	2.98%	11.27%	378%	12
Other Esophageal Disorders	3.62%	7.72%	213%	12
Crushing Injury or Internal Injury	1.53%	5.63%	369%	12
Fracture of Pelvis	1.14%	4.18%	366%	12
Anal and Rectal Conditions	1.96%	8.24%	421%	11
Diabetes with Neurological Manifestations	1.27%	4.97%	390%	11
Empyema and Pneumothorax	5.71%	12.90%	226%	11
Peritonitis and Intestinal Abscess	6.71%	14.93%	222%	11
Other Diseases of the Genitourinary System	1.48%	3.64%	246%	11
Fracture of Vertebral Column without Mention of Spinal Cord Injury	1.09%	2.93%	269%	11
Secondary Malignancy of Brain/Spine	2.21%	7.61%	345%	11
Substance-related Disorders	0.97%	5.33%	551%	11

67. Figure 10 below shows that Baylor used a higher rate of severe malnutrition not just in the few categories listed above, but across a large variety of principal diagnosis codes. The red dots to the right of the 45-degree line indicate higher rates of severe malnutrition at Baylor versus the nationwide average. This figure shows that Baylor has a higher rate of severe malnutrition for 173 out of 184 (94.02%) principal diagnosis categories. In other words, the extent to which Baylor excessively upcoded severe malnutrition on the categories listed in Table 8 above was not offset by relative downcoding in other principal diagnosis categories.

Figure 10. Rate of Severe Malnutrition by Principal Diagnosis Code at Baylor Versus Other Hospitals.
For the 184 principal diagnoses with at least 100 claims at Baylor (each represented by a dot), this figure compares the rate of severe malnutrition at Baylor versus non-Baylor hospitals. Red dots to the right of the 45-degree line indicate Baylor is coding severe malnutrition at a rate higher than the nationwide average.



ii. Specific False Claims with Severe Malnutrition

68. The Relator has identified many specific false Medicare claims submitted by Baylor involving severe malnutrition. The following table includes 50 examples.

Table 9. False Claims Made by Baylor Using Severe Malnutrition.
The following table presents specific examples of false claims made by Baylor using severe malnutrition. The first six digits of the beneficiary ID has been removed to make it harder to identify the individual patients.

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]							

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]							

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]							

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]							

Beneficiary ID/ Claim ID	Hospital	Discharge Date	Age/ Gender/ Race	Principal Diagnosis	MCC False Claim	DRG w/ False Claim	False Claim Amount
[redacted]							

2. Alternative Hypotheses for Excessive Rates of Misstated MCCs Do Not Stand and Confirm that Baylor Fraudulently Billed Medicare

69. To further demonstrate the Defendants' fraud and determine responsibility for the excessively high rates of Misstated MCCs, Relator has analyzed whether the statistically aberrant rates of Misstated MCCs described above could be attributed to a variety of other factors. First, Relator ran a fixed effect linear regression model to control for a variety of possible explanations for MCCs, including patient characteristics and county demographic data. Second, Relator considered whether the patient's attending physician is responsible for the excessive MCCs by analyzing a subset of claims where Baylor and other hospitals shared a common physician. Third,

Relator analyzed a subset of claims where Baylor and other hospitals shared common patients. Finally, Relator analyzed the upcoding rate for Baylor and other hospitals in the same metropolitan statistical area ("**MSA**") to determine whether the MCC upcoding is due to regional differences. As discussed further below, these analyses prove that the excessive rates of Misstated MCCs can be directly attributed to the Defendants' fraudulent activity as opposed to external factors, indicating that the fraud was known by the system and was intentional.

A. Patient Characteristics and Demographics do not Explain the Excessive Rates of Misstated MCCs at Baylor

70. The Relator developed a proprietary linear regression model to control for the possibility that there are certain patient characteristics which might indicate a higher likelihood a patient would have a MCC, allowing Relator to isolate and calculate the specific impact Defendants had on the abuse of a Misstated MCC code after controlling for other characteristics. These characteristics include basic patient characteristics, such as the age, gender, and race, as well as characteristics relating to the patient's inpatient stay, including principal diagnosis, length of stay, and discharge status. Relator also used county-level demographic data, such as unemployment rate, percent of population without a high school diploma, median income, and the rural-urban continuum codes from the Department of Agriculture as control variables.[14] These county demographic variables provided Relator with a proxy for the income levels, education levels, and access to care available to each patient. Regression analysis is well established and has been used to pinpoint actors behind misreporting in financial and economic contexts.[15] Relator's

[14] The Rural-Urban Continuum Codes measure whether each county is in a metro or non-metro area and reflect the overall size of the metropolitan area.

[15] *See, for example,* Tomasz Piskorski, Amit Seru, and James Witkin, *Asset Quality Misrepresentation by Financial Intermediaries: Evidence from the RMBS Market*, The Journal of Finance, Vol. 70.6 (2015), at 2635–2678; Griffin, John M., and Gonzalo Maturana, *Who Facilitated Misreporting in Securitized Loans?*, Review of Financial Studies, Vol. 29.2 (2016), at 384–419.

regression analysis analyzed millions of claims and thousands of possible fraudulent patterns to calculate the total fraud committed by Baylor.

71. In this section, Relator employs three different regression analysis methodologies, each of which demonstrate how Defendant billed for the Misstated MCCs at fraudulently excessive rates. First, Relator uses a principal diagnosis bin-based fixed effect linear regression model to calculate the excessive Misstated MCCs in each principal diagnosis category. Second, Relator runs a fixed effect linear regression across all claims. Third, Relator calculates the residual for each system and hospital to determine the unexplained rate of Misstated MCCs across all systems and then across all hospitals.

i. Principal Diagnosis Bin-Based Fixed Effect Linear Regression

72. First, Relator continued with the principal diagnosis bin approach by running separate regressions for each principal diagnosis category. This approach provides a number of benefits. First, it allows for non-linear relationships so that the effect of each of the control variables can vary between principal diagnosis codes. For example, the impact length of stay has on the likelihood of an MCC might vary from one principal diagnosis code to another. Second, it allows for the specific quantification of the defendants' impact on MCC rates for claims within each principal diagnosis category.

73. Lastly, Relator included a fixed effect control variable for Baylor in the regression model, which represents the incremental amount of excessive MCC rates at Baylor beyond what could be explained by other variables. Equation 1 shows the fixed effect linear regression model used by Relator.

Equation 1. Relator's Fixed Effect Linear Regression Model.
The following equation presents the fixed effect linear regression model used by Relator. The variable of interest is β_1, which is the coefficient for Baylor. Panel A provides the equation, and Panel B explains the variables included in the model. The *i* refers to a specific claim and *j* refers to the potential options for the categorical variables.

Panel A: Fixed Effect Regression Model

$$MCC_i = \beta_0 + \beta_1.Providence_i + \sum_{j=2}^{6} \beta_{2j}.Age_{ij} + \sum_{j=2}^{7} \beta_{3j}.Race_{ij} + \beta_4.Male_i + \beta_5.\log LOS_i + \sum_{j=2}^{3} \beta_{6j}.Discharge_{ij} + \sum_{j=2}^{4} \beta_{7j}.Season_{ij} + \sum_{j=2}^{9} \beta_{8j}.RUCC_{ij} + \beta_9.Pov_i + \beta_{10}.Unemp_i + \beta_{11}.Income_i + \varepsilon_i$$

Panel B: Explanation of Regression Variables

Variable	Description
β_0	Intercept
MCC_i	Whether the claim included a MCC
$Providence_i$	Whether the patient was treated at Baylor
Age_{ij}	Patient's age on the claim (6 age groups)
$Race_{ij}$	Patient's race on the claim (7 race categories)
$Male_i$	Patient's gender
LOS_i	The patient's log length of stay at the hospital for claim i
$Discharge_i$	The patient's discharge status
$Season_{ij}$	Season control variable for the claim (Winter, Spring, Summer, Fall)
$RUCC_{ij}$	Patient's rural urban continuum code based on the county
Pov_i	County poverty rate in 2014
$Unemp_i$	County unemployment rate in 2014
$Income_i$	County log median income in 2014
ε_i	Error term

74. By controlling for these characteristics, the regression model allowed Relator to isolate the impact that being treated at a Baylor hospital would have on a patient's expected likelihood of being diagnosed with one of the Misstated MCCs. For example, given two patients with abdominal pain, with the same age and gender, from the same county, admitted during the same season, and with the same length of stay, the patient treated at Baylor would be 337.21% as likely to be diagnosed with encephalopathy.

75. The results for the Misstated MCCs are shown in Figure 11. Each bar represents the marginal effect of Baylor on the MCC rate relative to other hospitals within each principal

diagnosis bin. As can be seen in Panel A for encephalopathy, the coefficients for each principle diagnosis bin are all above 100% which indicates that encephalopathy rates are higher at Baylor, even after controlling for other characteristics. Statistical significance of a coefficient that is less than one in a thousand is in orange, while if the rate is even more rare at one in a million or less it is in pink, and if the probability that the coefficient could happen by chance is even lower at less than one in a hundred million then the bar is in red. As can be seen in Panel A of Figure 11, 67.6% of the bars have a probability of being due to chance of less than 1 in 1 million. Notably, only two of the 37 patterns have a significance level less than 1 in 1 thousand.[16]

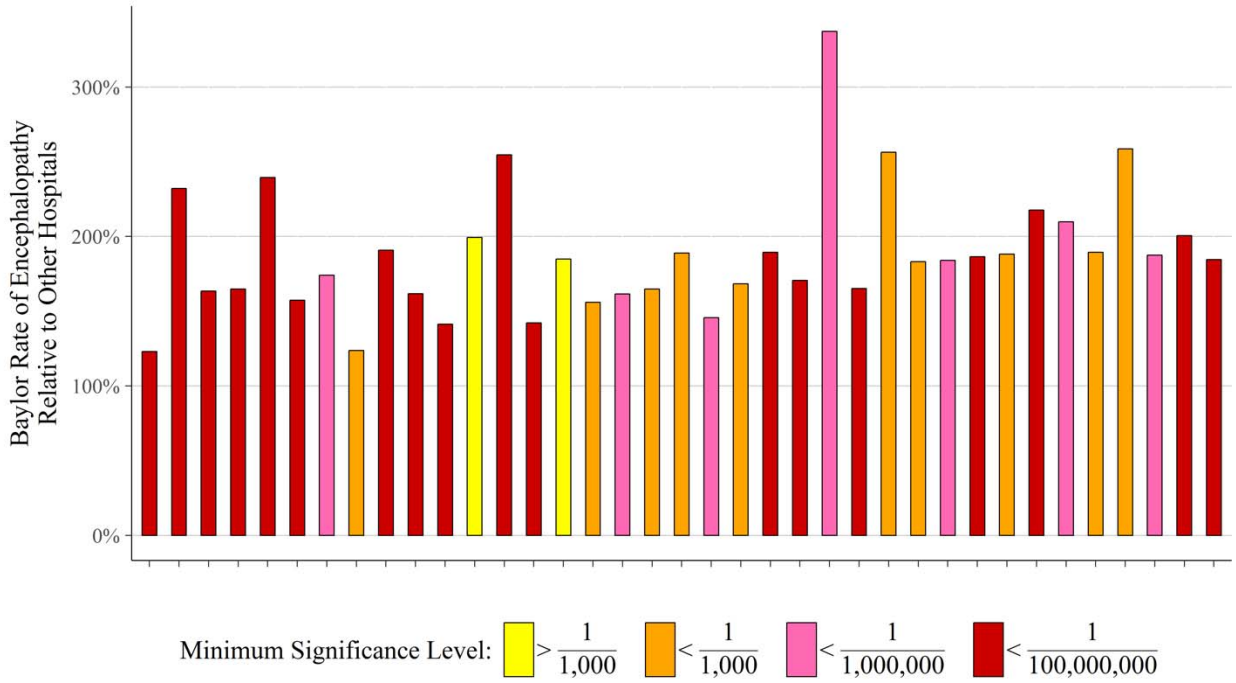
76. Respiratory failure is shown in Panel B, and severe malnutrition is shown in Panel C. For respiratory failure, 69.6% of the 56 patterns are significant at less than 1 in 100 million, and all have a significance of at least 1 in 1 thousand. For severe malnutrition, 85.3% of the 116 patterns are significant at less than 1 in 1 million, and all 116 are significant at less than 1 in 1 thousand. There are fewer bars for encephalopathy and respiratory failure because there are fewer relevant patterns in which Baylor's coding of Misstated MCCs was deemed excessive. This evidence demonstrates the excessive coding of Misstated MCCs at Baylor, even after controlling for other characteristics.

[16] Even the principal diagnosis codes that were not statistically significant at less than 1 in 1,000 were still significant at a 99% confidence level.

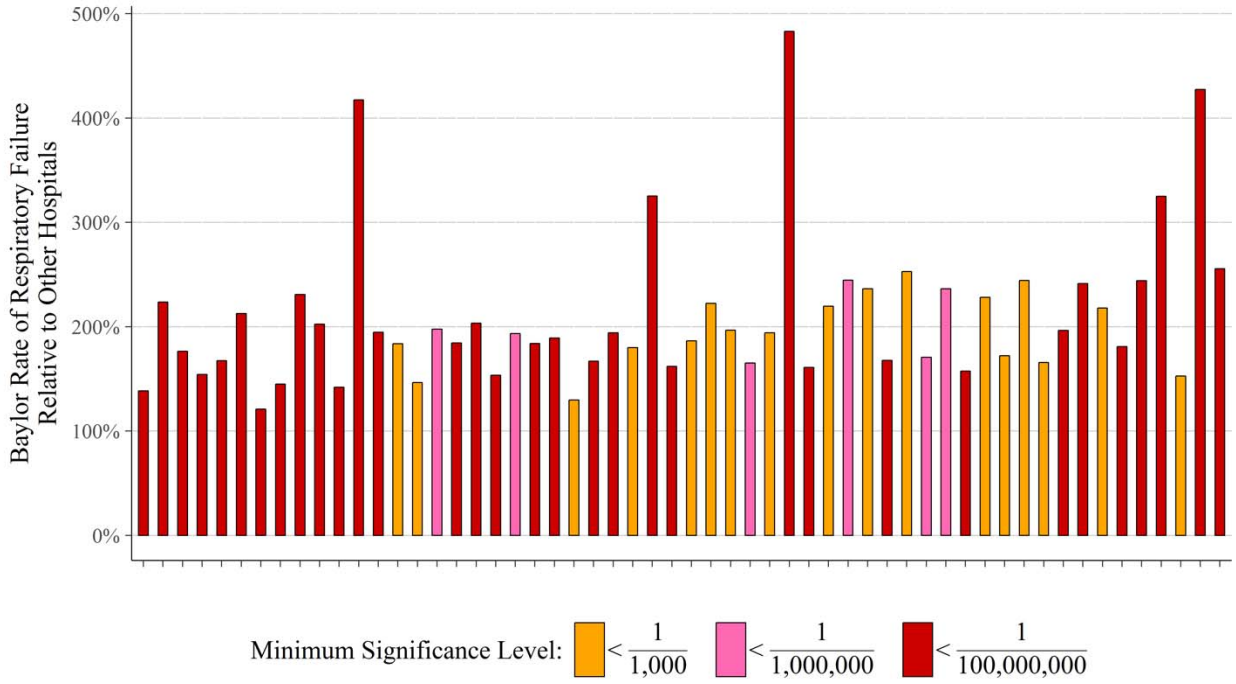
Figure 11. Regression-Adjusted Misstated MCC Usage at Baylor Relative to Non-Baylor Hospitals for Each Principle Diagnosis Bin.

Relator used principal diagnosis bin-based fixed effect linear regressions to analyze approximately 50 million claims at Baylor and other hospitals. The results for each principal diagnosis bin are presented in the following figure. The vertical lines represent Baylor's marginal effect on the rate of Misstated MCCs relative to the rate at other hospitals nationwide, where values above 100% indicate excessive MCC upcoding. The bins are ordered from left to right consistent with the order of principal diagnosis codes in Table 2, Table 5, and Table 8. The statistical significance is denoted by the coloring described in the legend. All but 2 were statistically significant at less than 0.1% chance the difference is random, and most were significant at a probability of less than 1 in 100 million.

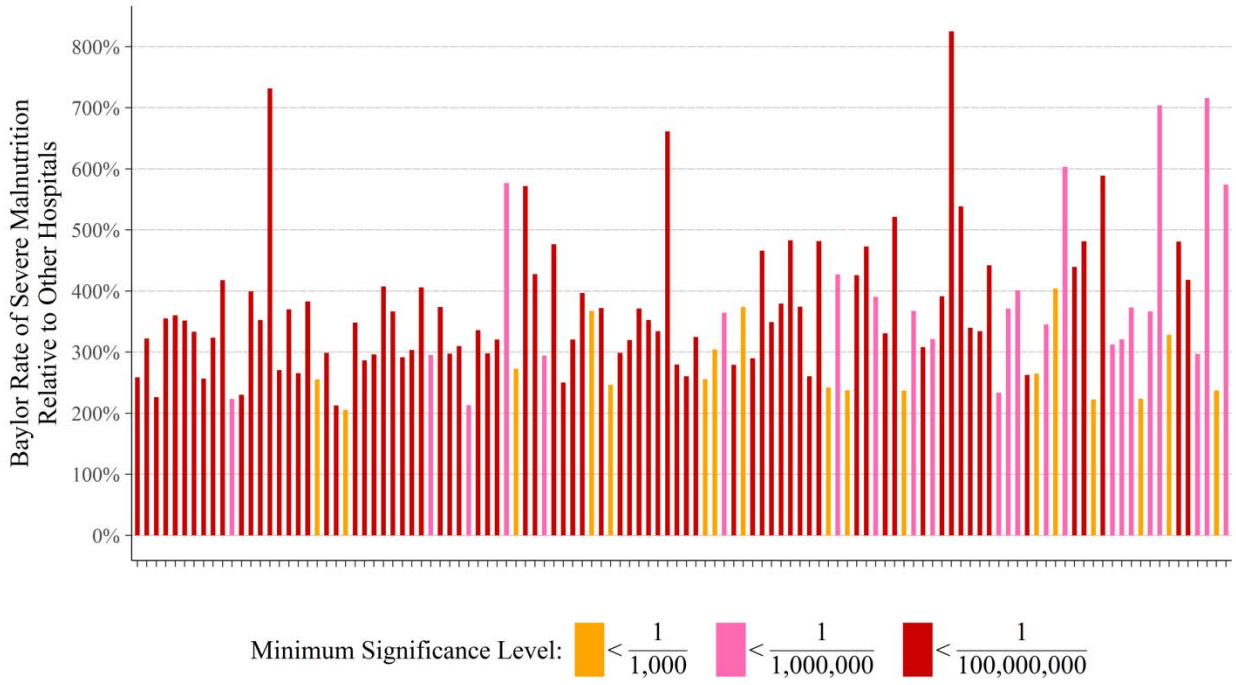
Panel A: Encephalopathy Regression Results by Principal Diagnosis Bin



Panel B: Respiratory Failure Regression Results by Principal Diagnosis Bin



Panel C: Severe Malnutrition Regression Results by Principal Diagnosis Bin



ii. Aggregate Fixed Effect Regression Model

77. Second, Relator also ran a regression to calculate the cumulative effect of Baylor's rate of Misstated MCCs across all claims in the relevant patterns. The same regression described in Equation 1 is used for this analysis, except relator runs one regression for all of the principal diagnosis codes in each MCC and adds a control variable for the inpatient principal diagnosis category. The length of stay variable is interacted with the principal diagnosis code to account for variation in the expected length of stay given a principal diagnosis code.

78. As shown in Table 10, after controlling for other factors, the Baylor coefficient for the Misstated MCCs is 0.0885. This means that 8.85 percent of Baylor claims are coded with one of the Misstated MCCs when they would not have been coded as such at another hospital. Given the baseline usage rate of the Misstated MCCs at other hospitals is 10.27 percent, Baylor's calculated rate of Misstated MCCs is 19.12 percent. In other words, Baylor's usage rate of the Misstated MCCs is 186.17% that of other hospitals, even after controlling for patient, medical, and demographic characteristics. This result is statistically significant with more than 99.9999 percent confidence—*i.e.*, almost certainly not random.

79. Not surprisingly, the individual coefficients for encephalopathy, respiratory failure, and severe malnutrition are also large in magnitude. Baylor's usage rate for encephalopathy was 151.88% of the rate at other hospitals, respiratory failure was 167.17%, and severe malnutrition was 315.56%.[17]

[17] For robustness analysis, Relator also considered the possibility that certain surgical procedure codes or admission sources (such as being admitted from the emergency room) might explain the higher rates of Misstated MCCs at Baylor. Relator ran the fixed-effect regression analysis while also including controls for surgical procedures and admission source. With these coefficients, Baylor's rate of Misstated MCCs was 168.27% relative to other non-Baylor hospitals. Similarly, the Baylor Systems' usage rate for encephalopathy was 148.24% of the rate at non-Baylor hospitals, respiratory failure was 138.69%, and severe malnutrition was 318.08%.

Table 10. Results of Fixed Effect Linear Regression Model.
Relator used the fixed effect linear regression discussed in Equation 1, except instead of running individual regressions for each principal diagnosis bin, Relator ran one regression for each Misstated MCC and included a control variable for the individual principal diagnosis categories. Relator analyzed approximately 50 million claims at Baylor and other hospitals. The results are presented in the following table. The coefficient is listed first and the p-value is in parenthesis, which represents the statistical significance of the coefficient. A lower p-value means the result is more statistically significant. Coefficients were not included for categorical variables. The Baylor coefficient is added to the rate at other hospitals to get the expected Baylor rate of excessive MCCs after including controls.

	Any of the MCCs	**Encephalopathy**	**Respiratory Failure**	**Severe Malnutrition**
Poverty Rate	-0.001 (<0.0001)	-0.0014 (<0.0001)	-0.0017 (<0.0001)	0.0003 (<0.0001)
Unemployment Rate	-0.0014 (<0.0001)	0.0011 (<0.0001)	-0.0019 (<0.0001)	-0.0006 (<0.0001)
Log (Median Income)	-0.0469 (<0.0001)	-0.0459 (<0.0001)	-0.0648 (<0.0001)	-0.0038 (<0.0001)
No High School Diploma Rate	-0.0008 (<0.0001)	-0.0006 (<0.0001)	-0.0009 (<0.0001)	-0.0001 (<0.0001)
Intercept	0.363 (0.1956)	0.4586 (0.1099)	0.5006 (0.179)	-0.0059 (0.9772)
Principal Diagnosis	Yes	Yes	Yes	Yes
Principal Diagnosis X Log(LOS[18])	Yes	Yes	Yes	Yes
Season Control Variables	Yes	Yes	Yes	Yes
Age Control Variables	Yes	Yes	Yes	Yes
Sex Control Variables	Yes	Yes	Yes	Yes
Race Control Variables	Yes	Yes	Yes	Yes
Discharge Status Control	Yes	Yes	Yes	Yes
Principal Diagnosis Category	Yes	Yes	Yes	Yes
RUCC Control	Yes	Yes	Yes	Yes
Baylor Coefficient	0.0885 (<0.0001)	0.0524 (<0.0001)	0.0800 (<0.0001)	0.0485 (<0.0001)
Nationwide Average	10.27%	10.10%	11.91%	2.25%
Baylor Rate	**19.12%**	**15.34%**	**19.91%**	**7.10%**
Baylor Rate Relative to Other Hospitals	**186.17%**	**151.88%**	**167.17%**	**315.56%**

[18] LOS stands for length of stay.

iii. System and Hospital Residuals for Misstated MCCs

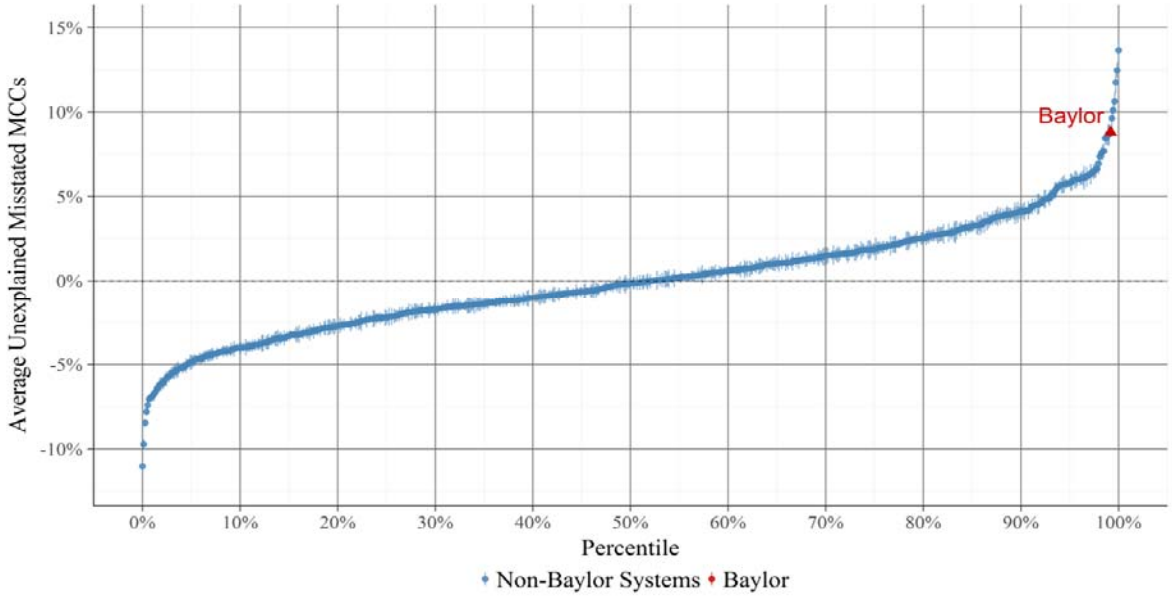
80. Third, another regression method to analyze Baylor's coding of Misstated MCCs is to calculate the unexplained rate of Misstated MCCs attributed to Baylor claims. To calculate this, Relator ran the regression without the fixed effect control variable for Baylor and calculated the probability each claim would have one of the Misstated MCCs. For each hospital system and for each individual hospital, the average difference between the predicted probability (or rate) of Misstated MCCs is compared to the actual rate of Misstated MCCs, which is referred to as a residual. The difference between these two values represents the rate of Misstated MCCs that is caused by each hospital system, after controlling for the other characteristics previously described. Panel A of Figure 12 shows the average residual for rate of Misstated MCCs for each hospital system, with Baylor plotted in red. Baylor's average unexplained rate of Misstated MCCs by this measure is 8.80%, making it 7th highest out of 737 hospital systems with at least 10,000 claims in the relevant patterns. Panel B of Figure 12 shows the average residual of each individual hospital, with Baylor hospitals plotted in red. The average residual of the Baylor hospitals ranges from 6.56% to 9.72%, and the 3 Baylor hospitals[19] are in the top 90th percentile of hospitals for unexplained rate of Misstated MCCs.

[19] Relator only alleges that Baylor University Medical Center – Dallas has been excessively using encephalopathy, so this hospital has been left out of this analysis which is based on any of the three Misstated MCCs. However, it is among the highest hospitals by rate of encephalopathy and including it in this calculation would only further demonstrate Baylor's fraudulent activity.

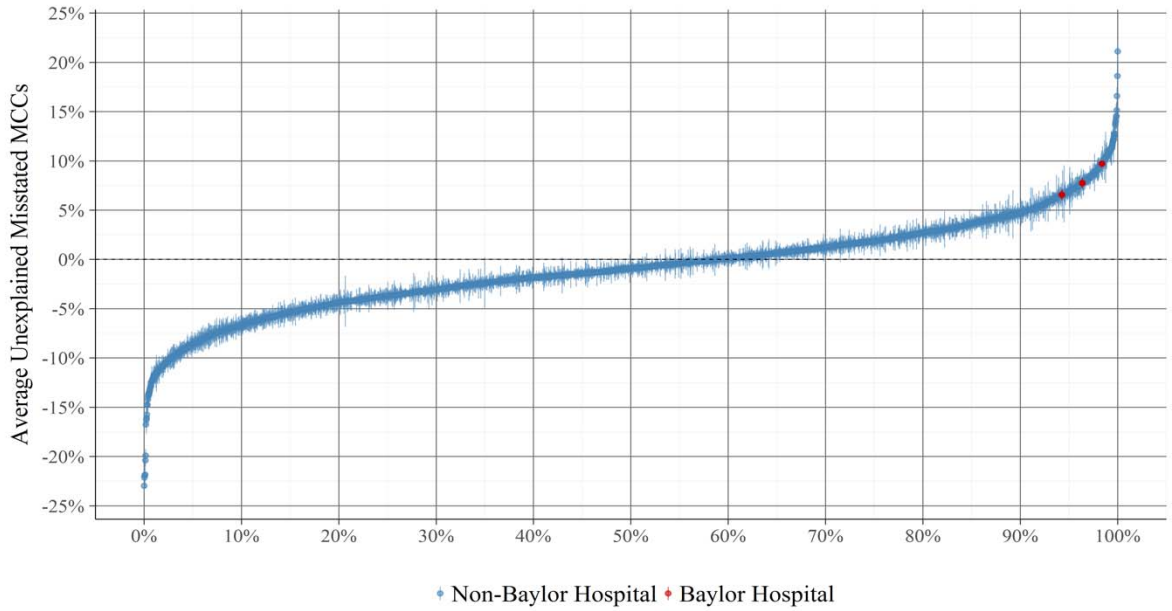
Figure 12. Average Unexplained Misstated MCC Rate for Each Hospital System and Individual Hospital.

The following figure plots the results of the regression from Equation 1, except one regression was run for all principal diagnosis bins, the control variable for principal diagnosis code was added to the regression, and the Baylor fixed effect variable was removed. All other variables included are the same. The graph in Panel A is based on 737 hospital systems with at least 10,000 claims from 2011 through June 2017. The graph in Panel B is based on 3,220 hospitals with at least 500 claims during the same time period. The small vertical lines off of the points represent the confidence interval for each system's unexplained use of Misstated MCCs.

Panel A: Average Residual of Any of the Misstated MCCs for Hospital Systems



Panel B: Average Residual of Any of the Misstated MCCs for Individual Hospitals



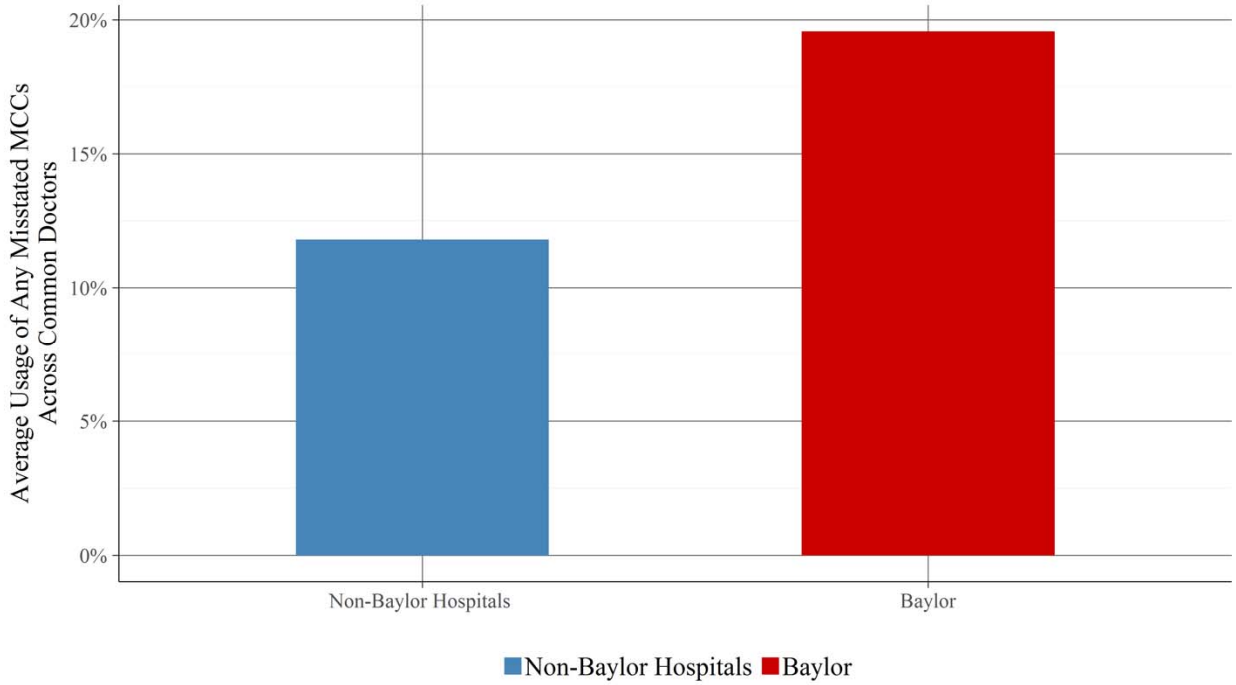
81. Taken together, Relator's regression analysis shows that the excessive rates of Misstated MCCs were not due to unique patient demographic or health characteristics, but were specifically caused by the Defendants' practices.

B. Attending Physicians are not Responsible for the Excessively High Rates of Misstated MCCs

82. Relator also considered whether the excessively high rates of Misstated MCCs could be caused by the preferences or treatment decisions of physicians who work with patients at Baylor hospitals, as opposed to some system-wide decision or corporate directive. Could it be that the physicians who attended to Baylor's patients were more disposed to identifying encephalopathy, respiratory failure, and severe malnutrition than other physicians? To address this question, Relator analyzed a subset of claims involving doctors that treated patients at both Baylor and other hospitals.

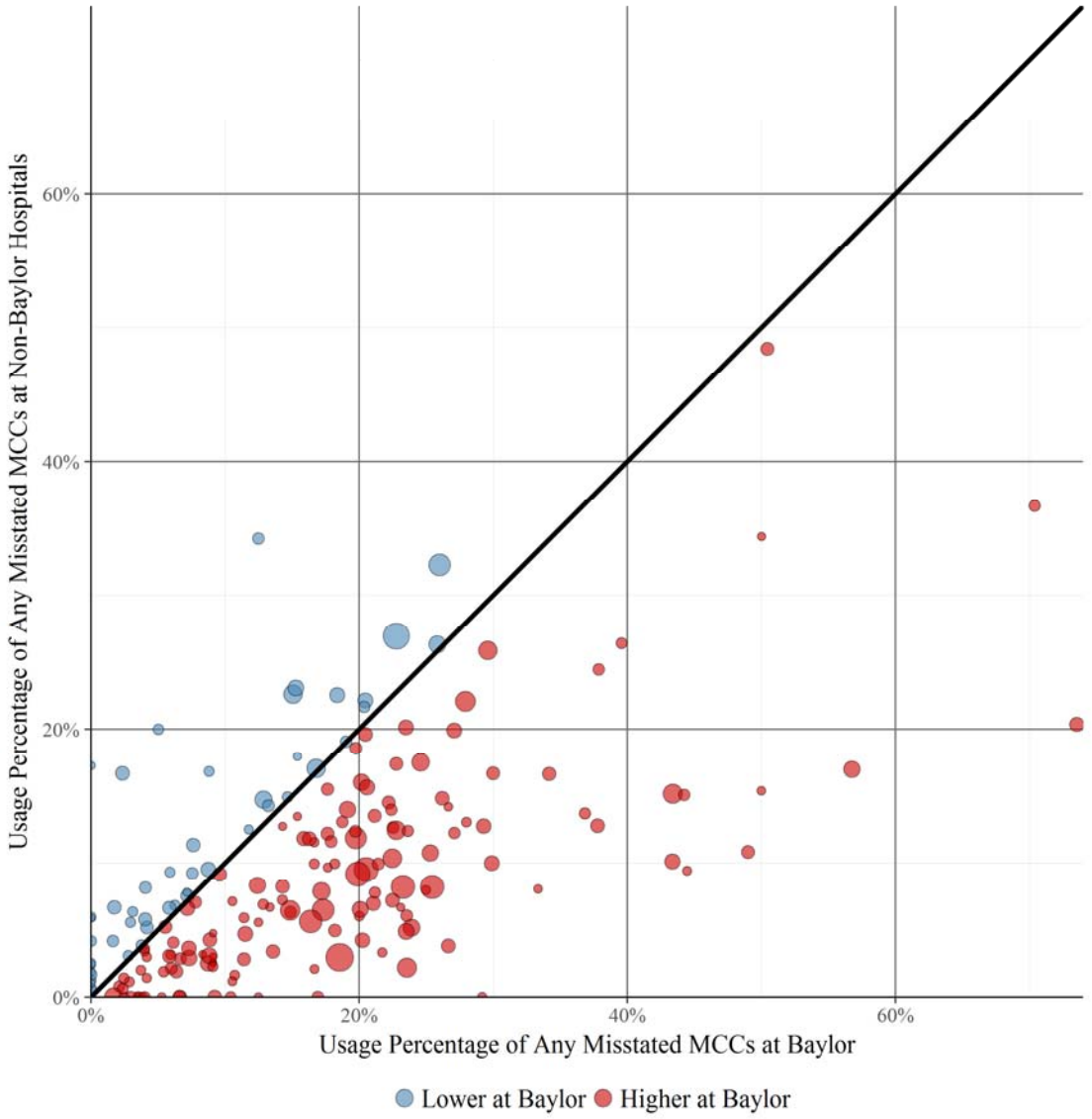
83. As shown in Figure 13, when considering only claims for doctors with at least 10 claims at both Baylor and other hospitals, the use of encephalopathy, respiratory failure, and malnutrition was still significantly higher at Baylor. Between 2011 and 2017, doctors used one of the Misstated MCCs on 19.57 percent of claims while treating patients at Baylor, but on only 11.80 percent of claims when treating patients at other hospitals.

Figure 13. Rate of Any of The Misstated MCCs at Baylor Relative to Other Hospitals for Claims with Common Doctors.
The following figure includes any claims for common doctors between Baylor and another hospital from 2011 through 2017. Even with doctors that work at both hospitals, Baylor used one of the Misstated MCCs on 19.57 percent of claims, while those same doctors only use one of the Misstated MCCs on 11.80 percent of claims while at other hospitals. The analysis is based on 195 doctors with 10 claims at Baylor and 10 claims at a non-Baylor hospital. In total these doctors had more than 25,000 claims at Baylor and more than 47,000 claims at other hospitals.



84. Figure 14 shows that this tendency to have higher rates of Misstated MCCs at Baylor is not limited to a few doctors but is systemic. In the following figure, doctors with the same rate of Misstated MCCs at Baylor and other hospitals would be clustered along the 45-degree line, whereas doctors with higher rates of Misstated MCCs at Baylor would be to the right of the 45-degree line. As shown in Figure 14, 147 out of 195 doctors (or 75.4 percent) had a higher coding rate of the Misstated MCCs at Baylor than at other hospitals.

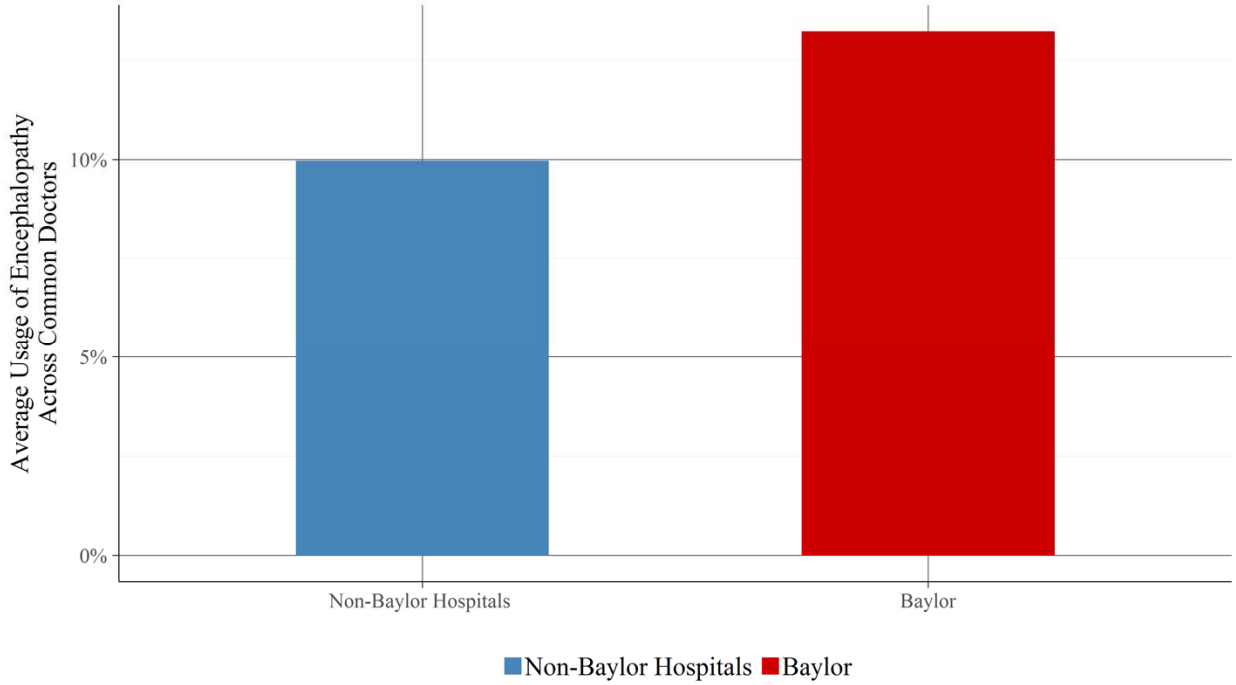
Figure 14. Rate of Any of the Misstated MCCs for Common Doctors at Baylor Versus Other Hospitals.
The following figure compares the rate of Misstated MCCs for common doctors at Baylor versus other hospitals. In the graph, the red circles to the right of the 45-degree line represent doctors who have higher upcoding at Baylor and the blue circles represent doctors who have higher upcoding at other non-Baylor hospitals. Only doctors with at least 11 claims at Baylor and 11 claims at a non-Baylor hospitals are represented in this figure.



85. This result still holds when looking just at the individual Misstated MCCs. For doctors that serve at both Baylor and other hospitals, the rate of encephalopathy at Baylor was 13.23 percent, while the rate of encephalopathy at other hospitals was 9.97 percent, as demonstrated in Figure 15 below. This indicates that a doctor was 132.7% as likely to diagnosis a

patient with encephalopathy when treating the patient at Baylor than when the same doctor was treating a patient at another hospital.[20]

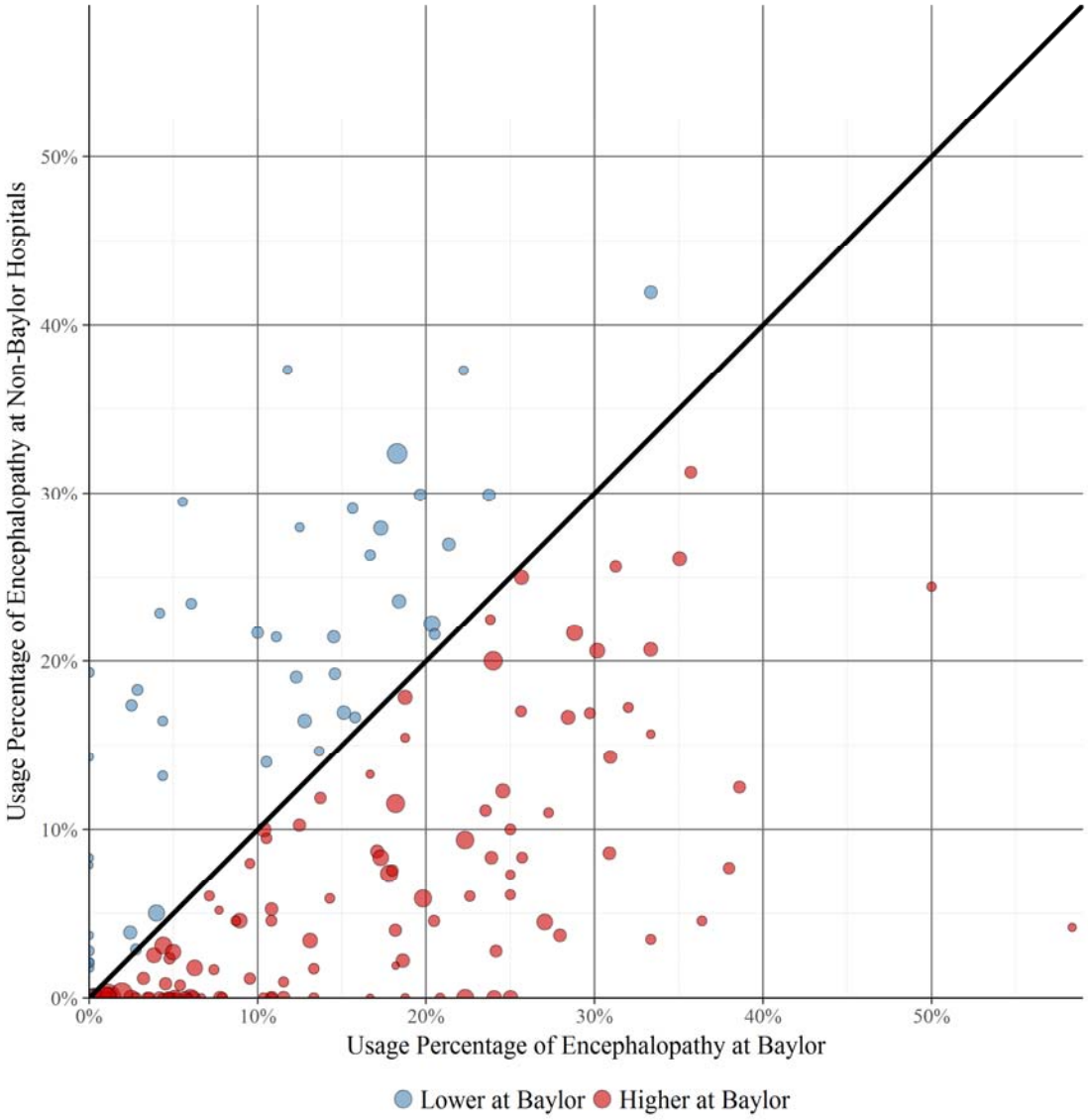
Figure 15. Rate of Encephalopathy at Baylor Relative to Other Hospitals for Claims with Common Doctors.
The following figure includes any claims for doctors with at least 10 claims at Baylor and 10 claims at a non-Baylor hospital from 2011 through June 2017. Even with doctors that work at both hospitals, Baylor had an encephalopathy rate of 13.23 percent, while those same doctors only use encephalopathy on 9.97 percent of claims while at other hospitals. The analysis is based on 162 doctors with 10 claims at Baylor and 10 claims at a non-Baylor hospital. In total these doctors had more than 12,000 claims at Baylor and more than 16,000 claims at other hospitals.



86. Figure 16 shows that a significant number of doctors had higher rates of encephalopathy when they worked at Baylor than at other hospitals. Specifically, it shows that 115 doctors out of 162 doctors considered (or 71 percent) had a higher rate at Baylor.

[20] This general trend still holds when looking at any doctor that has at least one claim at Baylor and one claim at a non-Baylor hospital. Specifically, the rate of encephalopathy is 14.23% at Baylor and 11.06% at other hospitals.

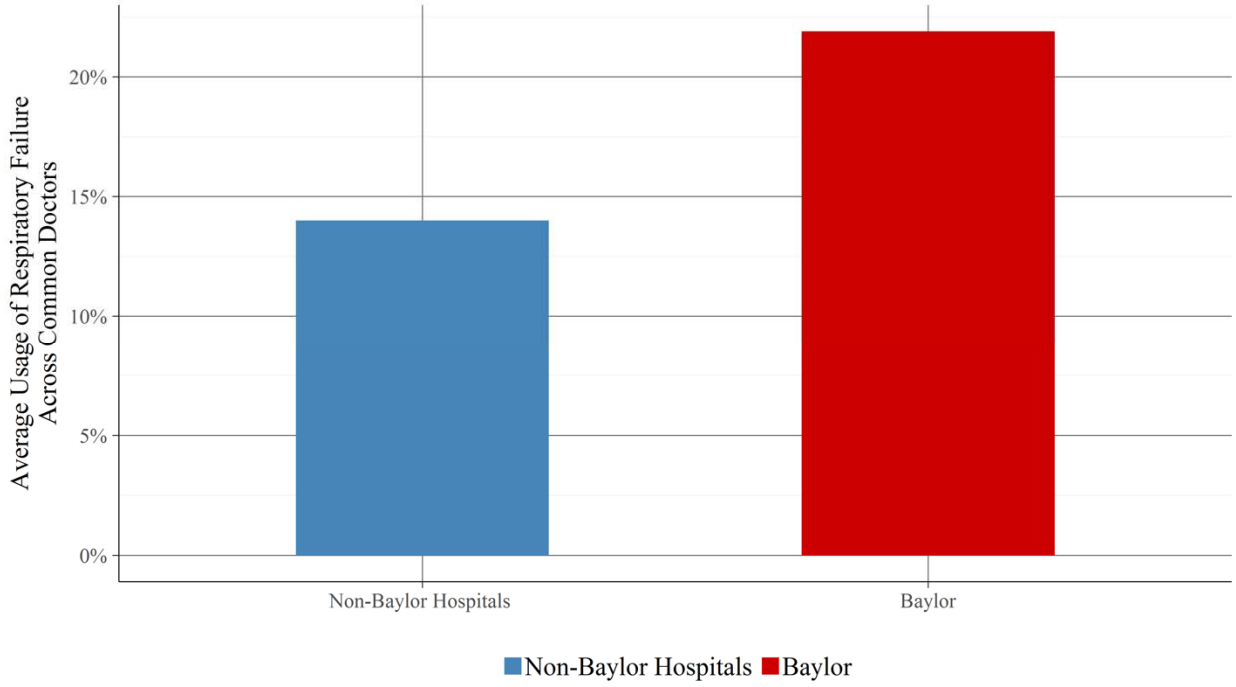
Figure 16. Rate of Encephalopathy for Common Doctors at Baylor Versus Other Hospitals.
The following figure compares the rate of encephalopathy for common doctors at Baylor versus other hospitals. In the graph, the red circles to the right of the 45-degree line represent doctors who have higher upcoding of encephalopathy at Baylor and the blue circles represent doctors who have higher upcoding at other non-Baylor hospitals. Only doctors with at least 11 claims at Baylor and 11 claims at a non-Baylor hospitals are represented in this figure.



87. For doctors that serve at both hospitals, the rate of respiratory failure at Baylor was 21.9 percent, while the rate of respiratory failure at other hospitals was 14.0 percent, as demonstrated in Figure 17 below. This suggests that a doctor was 156.4% as likely to diagnosis a

patient with respiratory failure when treating the patient at Baylor than when the same doctor was treating a patient at a non-Baylor hospital.[21]

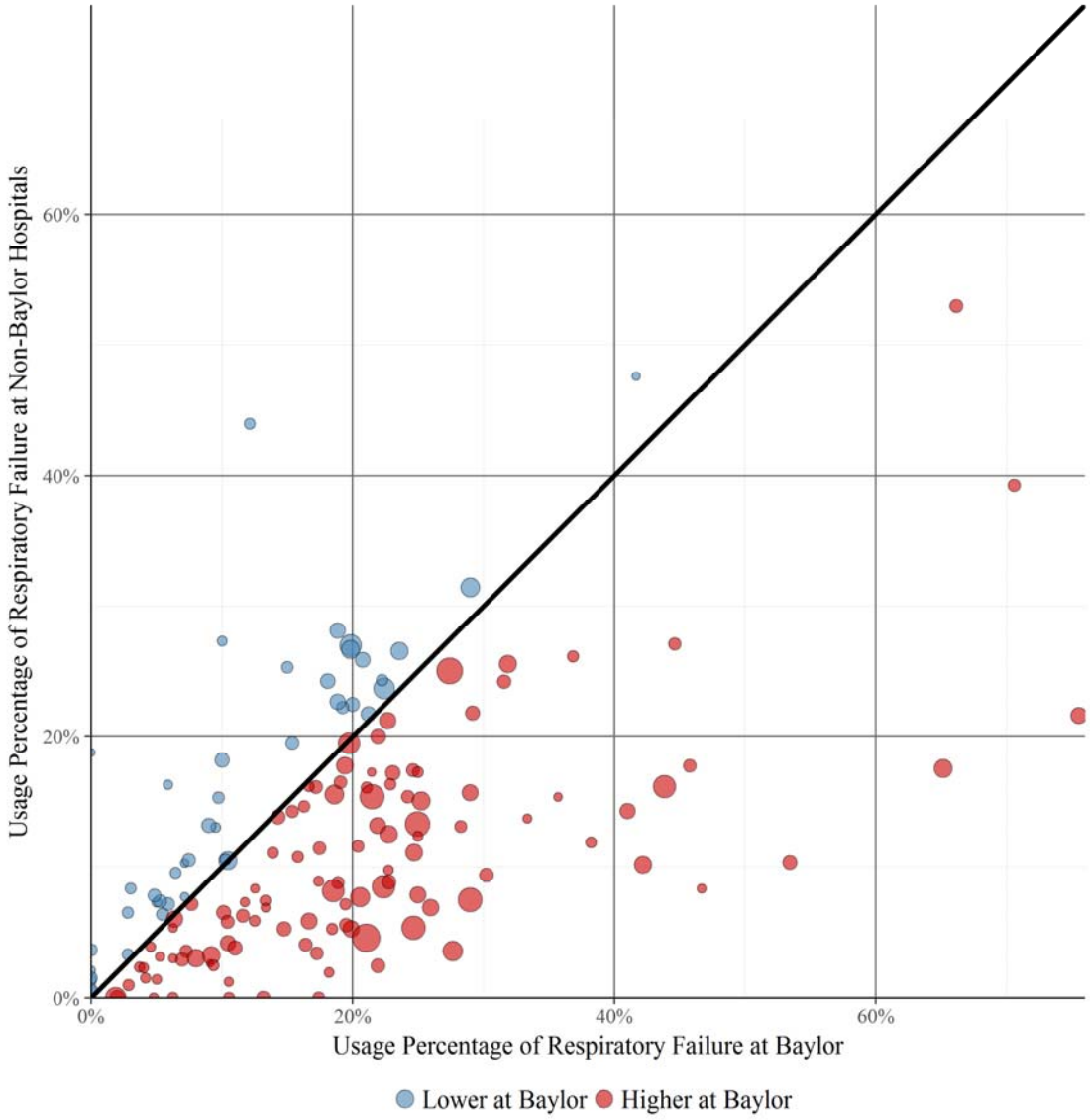
Figure 17. Rate of Respiratory Failure at Baylor Relative to Other Hospitals for Claims with Common Doctors.
The following figure includes any claims for doctors with at least 10 claims at Baylor and 10 claims at a non-Baylor hospital from 2011 through June 2017. Even with doctors that work at both hospitals, Baylor had a respiratory failure rate of 21.9 percent, while those same doctors only use respiratory failure on 14.0 percent of claims while at other hospitals. The analysis is based on 154 doctors with 10 claims at Baylor and 10 claims at a non-Baylor hospital. In total these doctors had more than 16,000 claims at Baylor and more than 27,000 claims at other hospitals.



88. Figure 18 shows that a significant number of doctors had higher rates of respiratory failure when they worked at Baylor than at other hospitals. Specifically, the figure shows that 110 out of 154 doctors considered (or 71.4 percent) had a higher rate at Baylor.

[21] This general trend still holds when looking at any doctor that has at least one claim at Baylor and one claim at a non-Baylor hospital. Specifically, the rate of respiratory failure is 21.83% at Baylor and 13.41% at other hospitals.

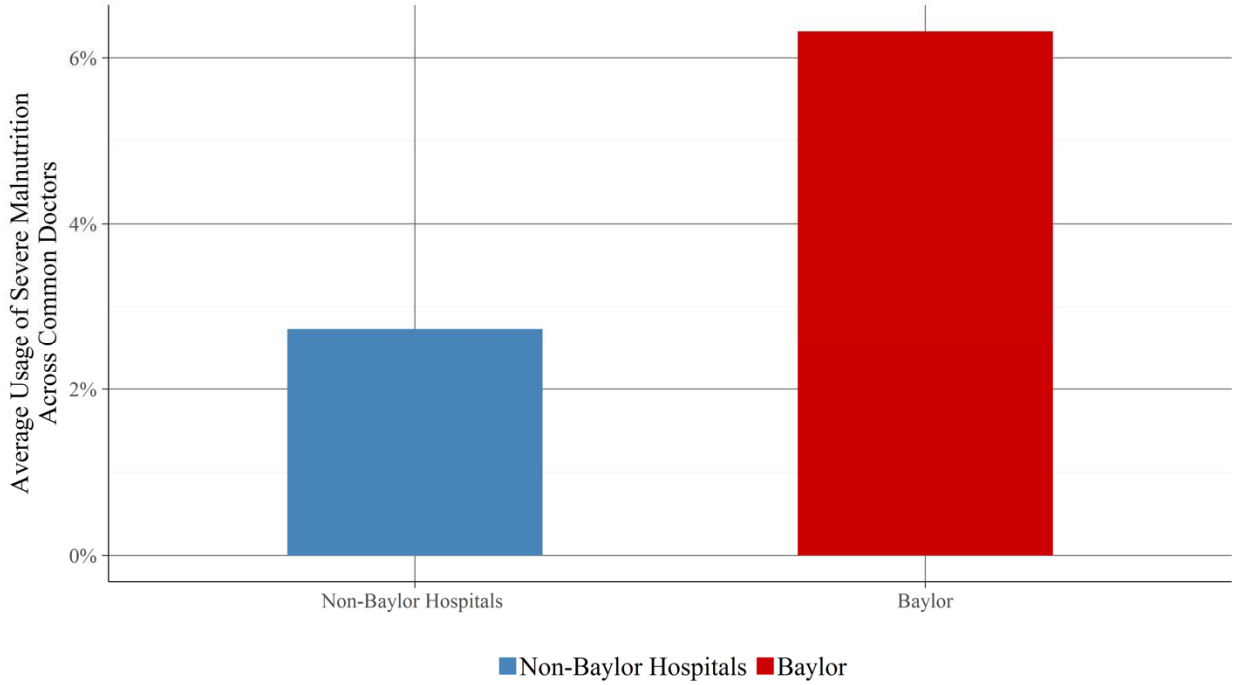
Figure 18. Rate of Respiratory Failure for Common Doctors at Baylor Versus Other Hospitals. The following figure compares the rate of respiratory failure for common doctors at Baylor versus other hospitals. In the graph, the red circles to the right of the 45-degree line represent doctors who have higher upcoding of respiratory failure at Baylor and the blue circles represent doctors who have higher upcoding at other non-Baylor hospitals. Only doctors with at least 11 claims at Baylor and 11 claims at a non-Baylor hospitals are represented in this figure.



89. For doctors that serve at both hospitals, the rate of severe malnutrition at Baylor was 6.32 percent, while the rate of severe malnutrition at other hospitals was 2.73 percent, as demonstrated in Figure 19 below. This indicates that a doctor was 231.5% as likely to diagnosis a

patient with severe malnutrition when treating the patient at Baylor than when the same doctor was treating a patient at a non-Baylor hospital.[22]

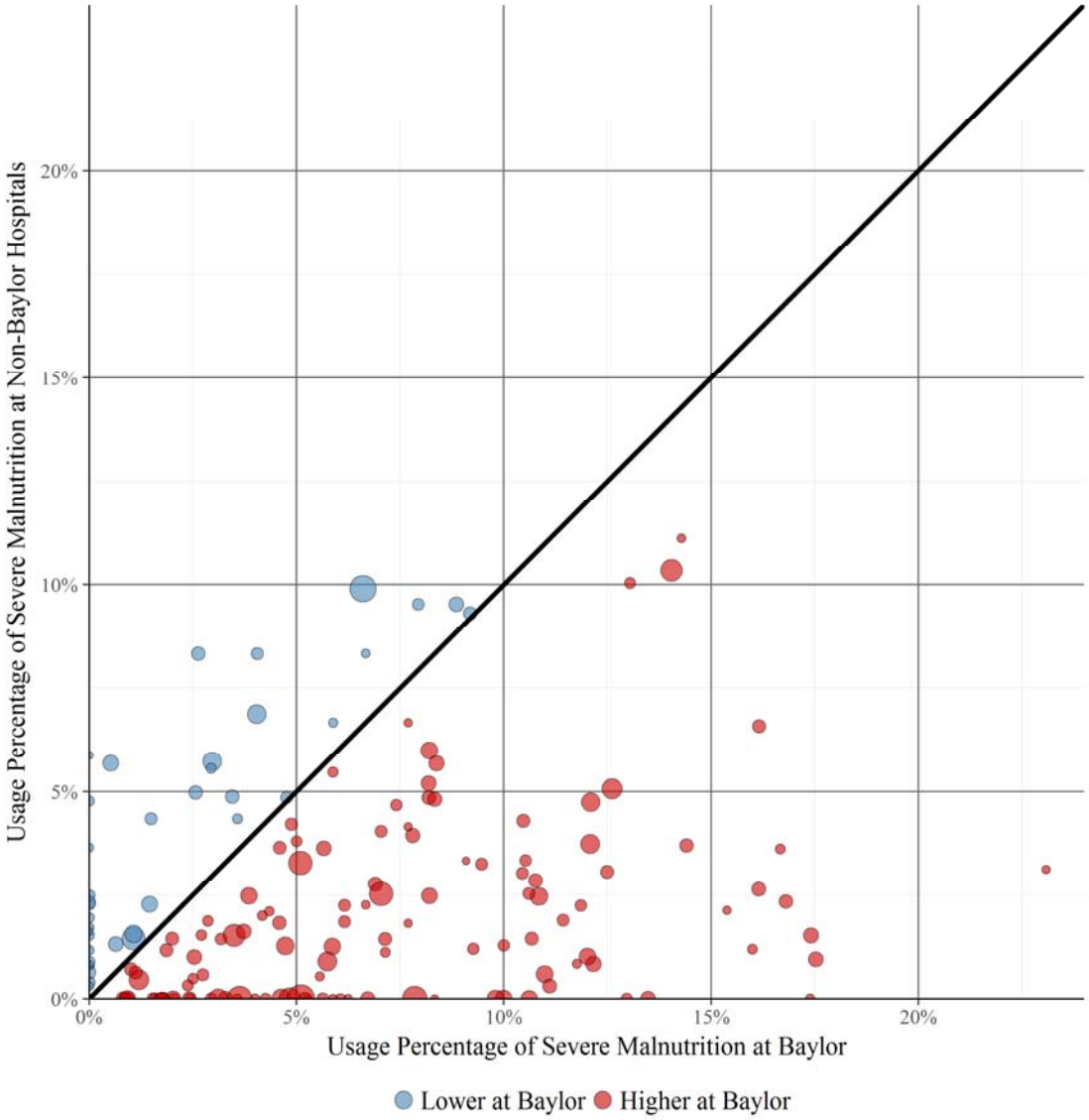
Figure 19. Rate of Severe Malnutrition at Baylor Relative to Other Hospitals for Claims with Common Doctors.
The following figure includes any claims for doctors with at least 10 claims at Baylor and 10 claims at a non-Baylor hospital from 2011 through June 2017. Even with doctors that work at both hospitals, Baylor had a severe malnutrition rate of 6.32 percent, while those same doctors only use severe malnutrition on 2.73 percent of claims while at other hospitals. The analysis is based on 161 doctors with 10 claims at Baylor and 10 claims at a non-Baylor hospital. In total these doctors had 23,541 claims at Baylor and 40,096 claims at other hospitals.



90. Figure 20 shows that a significant number of doctors had higher rates of severe malnutrition when they worked at Baylor than at other hospitals. For example, the figure shows that 123 doctors out of 161 doctors considered (or 76.4 percent) used a higher rate at Baylor.

[22] This general trend still holds when looking at any doctor that has at least one claim at Baylor and one claim at a non-Baylor hospital. Specifically, the rate of severe malnutrition is 6.81% at Baylor and 2.64% at other hospitals.

Figure 20. Rate of Severe Malnutrition for Common Doctors at Baylor Versus Other Hospitals. The following figure compares the rate of severe malnutrition for common doctors at Baylor versus other hospitals. In the graph, the red circles to the right of the 45-degree line represent doctors who have higher upcoding of severe malnutrition at Baylor and the blue circles represent doctors who have higher upcoding at other non-Baylor hospitals. Only doctors with at least 11 claims at Baylor and 11 claims at a non-Baylor hospitals are represented in this figure.



91. Relator identified the specific doctors that had higher rates of severe malnutrition at Baylor relative to other hospitals. Table 11 below lists the ten doctors with the largest disparity in severe malnutrition rates when they worked at Baylor compared to when they worked at other

hospitals. Each of these doctors coded severe malnutrition at a rate at least six times higher when at Baylor.[23]

Table 11. Doctors with the Most Excessive Rates of Severe Malnutrition at Baylor Versus Other Hospitals.
This table shows the difference in severe malnutrition usage for the ten doctors with the highest difference in severe malnutrition usage at Baylor versus other hospitals. The first seven digits of the physician ID have been hidden by Relator so the specific physician will not be identifiable directly from this complaint. Only doctors with at least 11 claims at Baylor and 11 claims at a non-Baylor hospitals are represented in this table.

Physician ID	Percent of Claims w/ Severe Malnutrition at Baylor	Percent of Claims w/ Severe Malnutrition at Other Hospitals	Difference in Percent	Baylor Rate Relative to Other Hospitals	P-Value
XXXXXXX031	23.08%	3.12%	19.95%	738%	0.0069
XXXXXXX184	17.39%	0.00%	17.39%	Infinity	<0.0001
XXXXXXX940	17.53%	0.94%	16.59%	1,858%	<0.0001
XXXXXXX494	17.42%	1.53%	15.89%	1,142%	<0.0001
XXXXXXX278	16.00%	1.19%	14.81%	1,345%	0.0002
XXXXXXX253	16.81%	2.34%	14.47%	720%	<0.0001
XXXXXXX159	16.15%	2.63%	13.52%	614%	<0.0001
XXXXXXX569	13.48%	0.00%	13.48%	Infinity	<0.0001
XXXXXXX301	15.38%	2.13%	13.26%	723%	0.0302
XXXXXXX723	16.67%	3.61%	13.05%	461%	0.0102

92. Relator also re-ran the regression analysis for the subset of claims that have at least 10 claims by a doctor at Baylor and a non-Baylor hospital.[24] Relator used the same controls from the regression described in section IV.D.2.A above, along with a control for the doctor that treated the patient. This allows Relator to quantify the marginal impact a patient being treated at Baylor has on a patient being diagnosed with a Misstated MCC, beyond what can be explained by patient characteristics, demographic characteristics, as well as the individual doctor. As shown in Table

[23] Relator only included the results for severe malnutrition because it has the most claims among the Misstated MCCs, providing the most thorough comparison.

[24] More than 63,000 claims for severe malnutrition and more than 73,000 claims for Misstated MCC were included in this regression. Severe malnutrition was the only specific Misstated MCC in which Relator ran the regression because it had the largest number of claims.

12, Baylor's rate of any MCC, after these controls, was 155.93 percent of the rate at other hospitals, and Baylor's severe malnutrition rate was 231.14 percent of the rate at other hospitals.[25]

Table 12. Fixed Effect Regression Results After Controlling for Attending Physician.
Relator used a linear regression to analyze approximately 73,000 claims with common doctors at Baylor and other hospitals. The results are presented in the following table. The coefficient is listed first and the p-value is in parenthesis, which represents the statistical significance of the coefficient. A lower p-value means the result is more statistically significant. Coefficients were not included for categorical variables.

	Any Misstated MCC	**Severe Malnutrition**
Poverty Rate	-0.002 (0.003)	0 (0.9365)
Unemployment Rate	-0.0041 (0.0111)	-0.0019 (0.0776)
Log (Median Income)	-0.0466 (0.0216)	-0.0221 (0.092)
No High School Diploma Rate	0.0006 (0.1692)	-0.0004 (0.1403)
Intercept	0.5243 (0.0299)	0.2651 (0.0883)
Principal Diagnosis	Yes	Yes
Principal Diagnosis X Log (LOS[26])	Yes	Yes
Season Control Variables	Yes	Yes
Age Control Variables	Yes	Yes
Sex Control Variables	Yes	Yes
Race Control Variables	Yes	Yes
Discharge Status Group Controls	Yes	Yes
Principal Diagnosis Category Controls	Yes	Yes
RUCC Control	Yes	Yes
Doctor Control Variables	Yes	Yes
Baylor Coefficient	0.0660 (<0.0001)	0.0358 (<0.0001)
Nationwide Average	11.80%	2.73%
Baylor Rate	**18.40%**	**6.31%**
Baylor Relative Effect	**155.93%**	**231.14%**

[25] Relator also considered whether the behavior of these doctors is due to their tendency to provide certain procedures at certain hospitals. To do this, Relator also added control variables for the procedure codes and the admission status to identify admissions as from the emergency room, elective, or urgent. For any Misstated MCC and for severe malnutrition, the coefficients were 0.0505 and 0.0358 respectively. In other words, Baylor's rate of Misstated MCC was 142.80 percent of other hospitals, and rate of severe malnutrition was 231.14 percent of other hospitals among claims with common doctors.

[26] LOS stands for length of stay.

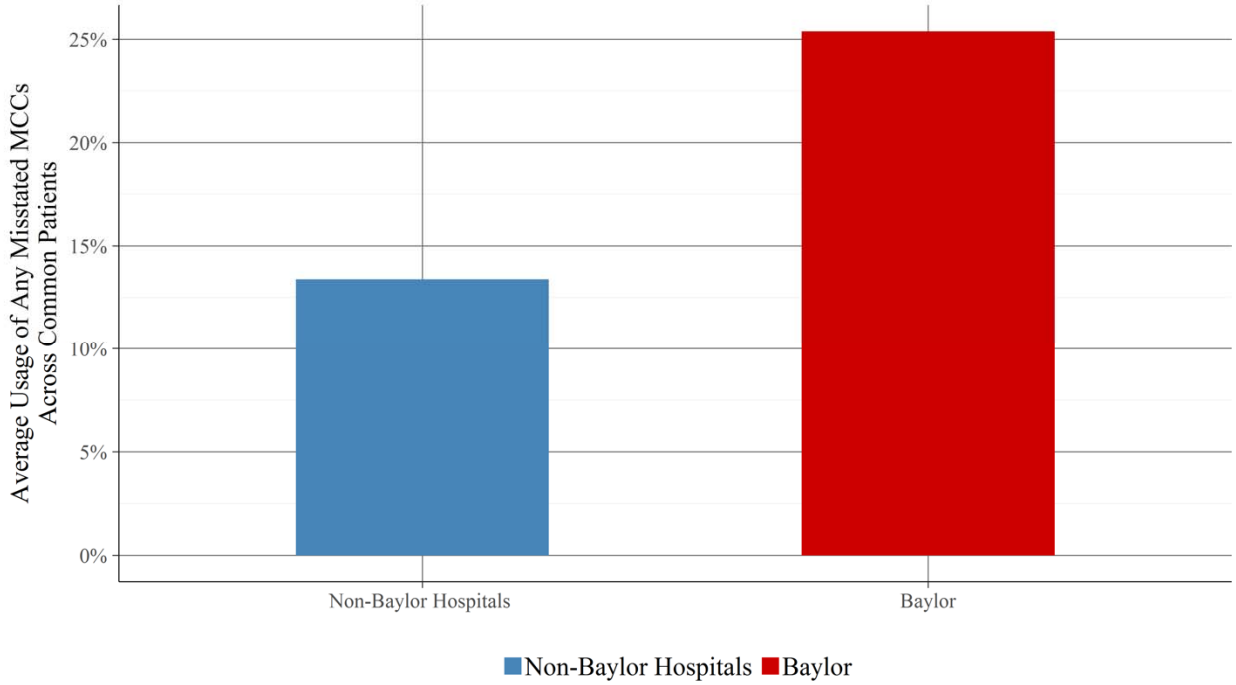
93. This analysis shows that the fraudulent upcoding was not caused by tendencies of certain doctors that treat patients at Baylor but was instead caused by clinical documentation and coding practices that were implemented specifically at Baylor.

C. Unique Characteristics of Baylor's Patients do not Account for the Excessively High Rates of Misstated MCCs

94. Relator also considered whether it might be something else about Baylor patients that would justify the higher rates of MCCs. Although Relator already considered a variety of patient characteristics in the fixed effect linear regression model, Relator also analyzed the subset of patients that attended both Baylor and at least one other hospital between 2011 and 2017, and then compared the rate of the MCC codes used when these patients were treated at Baylor versus when treated at other hospitals.

95. As shown in Figure 21, when only analyzing patients that have at least 5 claims at both Baylor and other hospitals, the use of encephalopathy, respiratory failure, and malnutrition was still significantly higher at Baylor. Between 2011 and 2017, patients were diagnosed with one of the Misstated MCCs on 25.38 percent of claims while being treated at Baylor, but on only 13.38 percent of claims at other hospitals. A patient being treated at Baylor was coded with the Misstated MCCs at a rate that was 189.7% the rate at other non-Baylor hospitals.

Figure 21. Rate of Any of The Misstated MCCs at Baylor Relative to Other Hospitals for Claims with Common Patients.
The following figure includes any claims for common patients between Baylor and a non-Baylor hospital from 2011 through June 2017. Even with patients at both hospitals, Baylor used one of the Misstated MCCs on 25.38 percent of claims, while those same patients only have one of the Misstated MCCs on 13.38 percent of claims while at other hospitals. The analysis is based on 155 patients with 5 claims at Baylor and 5 claims at a non-Baylor hospital. In total these patients had 1,430 claims at Baylor and 1,547 claims at other hospitals.



96. Figure 22 shows a significant number of patients had higher rates of Misstated MCCs when treated at Baylor. Dots to the right of the 45-degree line indicate the patient was coded with higher rates of the Misstated MCCs at Baylor than at other hospitals. The graph shows that 107 out of 155 patients considered (or 69.0 percent) had a higher usage rate of the Misstated MCCs at Baylor than at other hospitals. This indicates the behavior is not limited to a few patients but is systemic.

Figure 22. Rate of Any of the Misstated MCCs for Common Patients.
The following figure compares the rate of Misstated MCCs for common patients at Baylor versus other hospitals. The red dots to the right of the 45-degree line represent patients who have higher rates of Misstated MCCs at Baylor and the blue dots represent patients who have lower rates of Misstated MCCs at Baylor. The size of the dot corresponds to the number of claims the patient had at Baylor.

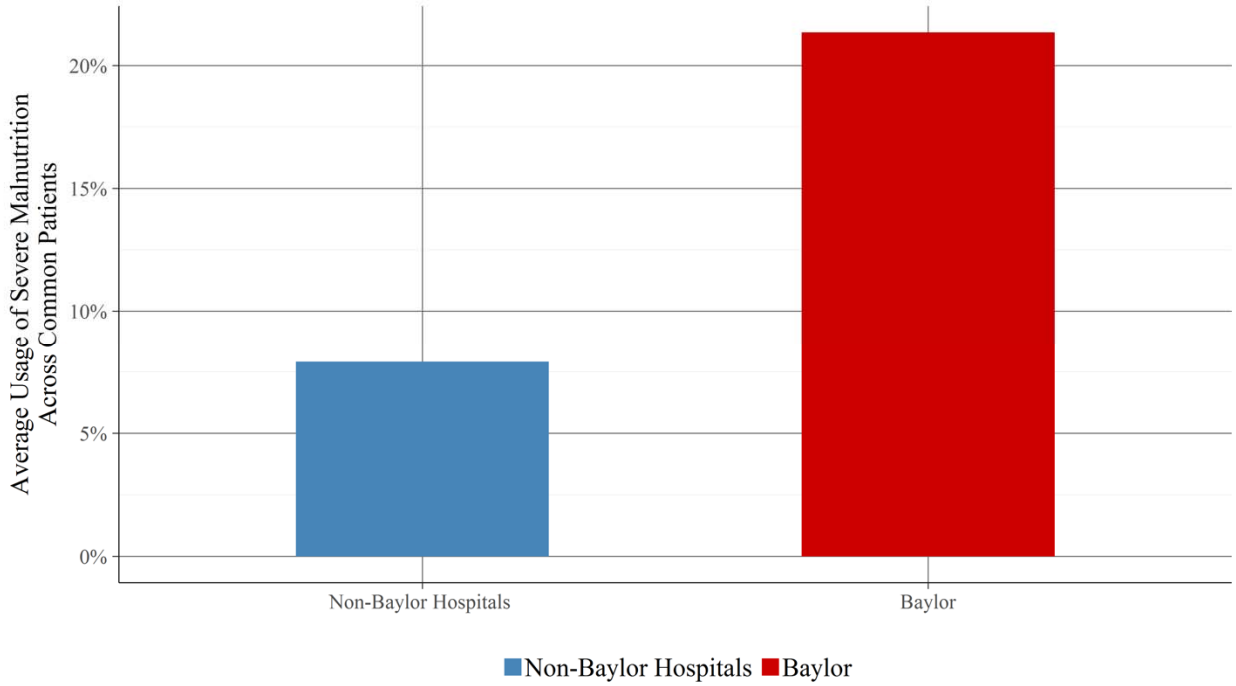
97. This result still holds when looking at just severe malnutrition.[27] For patients that were at both hospitals, the rate of severe malnutrition at Baylor was 21.36 percent, while the rate of severe malnutrition at other hospitals was 7.91 percent, as demonstrated in Figure 23 below.

[27] Relator only included the results for severe malnutrition as it was the only Misstated MCC with a sufficient number of claims and common patients to conduct this analysis.

This suggests that a patient was 270% as likely to diagnosis a patient with severe malnutrition when treating the patient at Baylor than when the same patient was treating a patient at a non-Baylor hospital.[28]

Figure 23. Rate of Severe Malnutrition at Baylor Relative to Other Hospitals for Claims with Common Patients

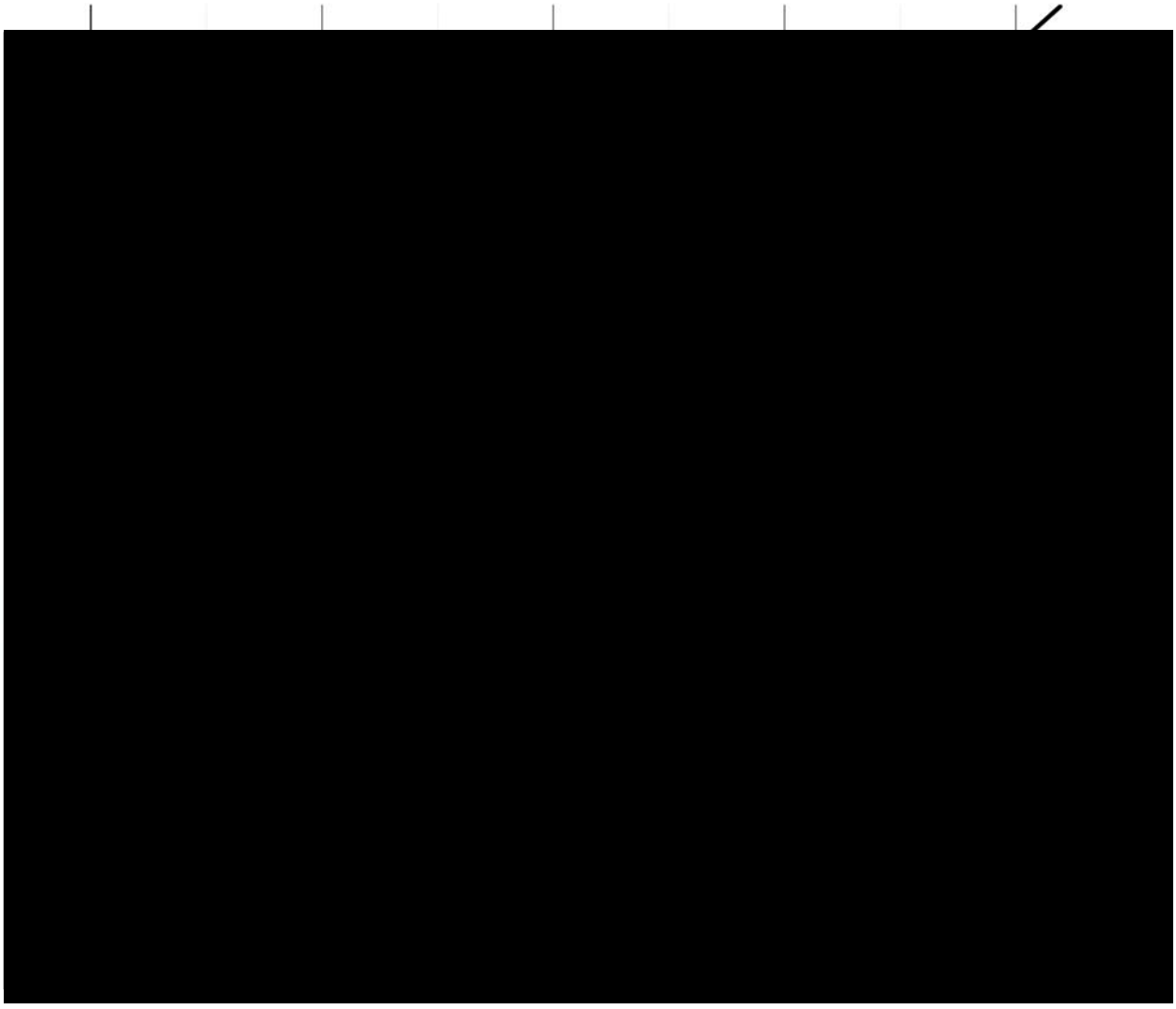
The following figure includes any claims for patients with at least 5 claims at Baylor and 5 claims at a non-Baylor hospital from 2011 through June 2017. Even with patients that are treated at both hospitals, Baylor had a severe malnutrition rate of 21.36 percent, while those same patients only use severe malnutrition on 7.91 percent of claims while at other hospitals. The analysis is based on 71 patients with 5 claims at Baylor and 5 claims at a non-Baylor hospital. In total these patients had 618 claims at Baylor and 746 claims at other hospitals.



98. Figure 24 shows that a significant number of patients had higher rates of severe malnutrition when they worked at Baylor than at other hospitals. For example, Panel A shows that 54 patients out of 71 patients considered (or 76.1 percent) used a higher rate at Baylor.

[28] This general trend still holds when looking at any patient that has at least one claim at Baylor and one claim at a non-Baylor hospital. Specifically, the rate of severe malnutrition is 38.1% at Baylor and 12.3% at other hospitals.

Figure 24. Rate of Severe Malnutrition for Common Patients
The following figure compares the rate of Severe Malnutrition for common patients at Baylor versus other hospitals. The red dots to the right of the 45-degree line represent patients who have a higher rate of Severe Malnutrition at Baylor and the blue dots represent patients who have lower rates of Severe Malnutrition at Baylor. The size of the dot corresponds to the number of claims the patient had at Baylor.



99. As this analysis shows, even when looking at the same patient, Baylor has significantly higher rates of Misstated MCCs than other hospitals. This shows that the upcoding behavior cannot be attributable to patient differences.

D. Regional Factors do not Explain Why Baylor Has Higher Rates of MCCs

100. Relator also considered whether the high rates of MCC upcoding at Baylor hospitals might be due to the region in which Baylor's hospitals are located. Although Relator has already controlled for a variety of county demographic factors through the regression, Relator now compares the rate of Misstated MCCs between Baylor and other hospitals within each MSA.

101. As shown in Table 13, Baylor had a significantly higher rate of Misstated MCCs in each MSA, with one MSA showing a rate more than twice as high at Baylor. As shown in Table 14, Baylor had a higher rate of encephalopathy than other hospitals in each MSA, with only one region (Killeen-Temple, TX) having a difference of less than seven percentage points. Table 15 and Table 16 show that Baylor had higher rates of respiratory failure and severe malnutrition, respectively, in each of the MSAs.

Table 13. Rate of Misstated MCCs at Baylor Versus Other Hospitals in the Same MSA.
This table compares the rate of Misstated MCCs in the suspicious patterns for the hospitals in Baylor and other hospitals within the same geographic region.

MSA	Baylor MCC Rate	Nationwide MCC Rate	Baylor Rate Relative to Other Hospitals	Probability
Austin-Round Rock, TX	15.93%	9.35%	170%	<0.0001
Killeen-Temple, TX	20.73%	14.75%	141%	<0.0001
Waco, TX	18.00%	8.85%	203%	<0.0001

Table 14. Rate of Encephalopathy at Baylor Versus Other Hospitals in the Same MSA.
This table compares the encephalopathy rate of the suspicious patterns for the hospitals in Baylor and other hospitals within the same geographic region.

MSA	Baylor Encephalopa-thy Rate	Nationwide Encephalopathy Rate	Baylor Rate Relative to Other Hospitals	Probability
Austin-Round Rock, TX	13.75%	7.41%	186%	<0.0001
Dallas-Fort Worth-Arlington, TX	17.59%	11.47%	153%	<0.0001
Killeen-Temple, TX	14.78%	14.69%	101%	0.3573
Waco, TX	12.20%	1.29%	944%	<0.0001

Table 15. Rate of Respiratory Failure at Baylor Versus Other Hospitals in the Same MSA.
This table compares the respiratory failure rate of the suspicious patterns for the Baylor hospitals and other hospitals within the same geographic region.

MSA	Baylor Respiratory Failure Rate	Nationwide Respiratory Failure Rate	Baylor Rate Relative to Other Hospitals	Probability
Austin-Round Rock, TX	16.62%	10.64%	156%	<0.0001
Killeen-Temple, TX	22.04%	18.44%	120%	<0.0001
Waco, TX	18.94%	11.91%	159%	<0.0001

Table 16. Rate of Severe Malnutrition at Baylor Versus Other Hospitals in the Same MSA.
This table compares the severe malnutrition rate of the suspicious patterns for the Baylor hospitals other hospitals within the same geographic region.

MSA	Baylor Malnutrition Rate	Nationwide Malnutrition Rate	Baylor Rate Relative to Other Hospitals	P-value
Austin-Round Rock, TX	5.12%	2.42%	212%	<0.0001
Killeen-Temple, TX	7.59%	2.15%	353%	<0.0001
Waco, TX	7.07%	1.47%	482%	<0.0001

102. Based on this regional analysis, Relator has shown that the fraudulent upcoding cannot be attributed to geographic factors unique to Baylor.

E. Summary of Determining What Caused Excessively High Rates of Misstated MCCs at Baylor

103. Relator has considered a number of potential explanations above to determine what phenomenon or which actor could be responsible for the excessively high rates of Misstated MCCs at Baylor. The excessively high rates are highly significant across 133 principal diagnosis categories and 4 Baylor hospitals, indicating that it is not driven by particular patient medical characteristics nor unique to only a few Baylor hospitals. Relator eliminated the possibility that the high Misstated MCC rates might be justified by or due to patient or demographic characteristics, attending physician preferences, or regional differences. Based on this, Relator has demonstrated that the only plausible explanation as to the cause of the excessively high rates of Misstated MCCs is that Baylor has implemented practices to maximize the amount of revenue it

can receive from Medicare by fraudulently upcoding, i.e., adding unsubstantiated MCC secondary diagnosis codes to its claims.

3. Economic Damages

104. Relator employed a robust and conservative methodology to quantify the economic damages caused by the Defendants' fraudulent coding encephalopathy, respiratory failure, and severe malnutrition. Relator has limited this complaint to only the most extreme cases—*i.e.*, where Baylor used a Misstated MCC code at two times the rate of comparable hospitals or at least three percentage points of its entire patient population higher than other hospitals. Additionally, only principal diagnosis bins where the excessive MCC usage rate was statistically significant at a 99.9% rate—or almost certainly not random—were considered fraudulent. The following describes Relator's methodology for aggregating the total dollar value of the fraud committed by Baylor.

105. Relator employs a principal diagnosis bin-based regression methodology for calculating damages. For each principal diagnosis bin, Relator re-ran its fixed effect linear regression model discussed in Equation 1 but changed the dependent variable to represent the additional revenue due to upcoding. For each claim, Relator calculated the difference in the DRG weight between claims with Misstated MCCs and claims without Misstated MCCs.[29] Relator then multiplied this difference in weights by Baylor's average base rate from 2011 through 2017, which was $5,554.01.[30] Within the regression for each principal diagnosis bin, the fixed effect for Baylor

[29] For claims that could have been a complication or without complication, Relator took a weighted average of DRG weights for the two DRGs and was weighted by Baylor's historical distribution of severity levels. Approximately 14.1% of claims were without complication and 85.9% of claims were with complication. If Baylor also upcodes using CC secondary diagnoses, the damage calculation would be even more conservative.

[30] The labor portion of the base rate was adjusted by the average wage index among Baylor hospitals from 2011 through 2017, and the capital portion was adjusted by the geographic adjustment factor over the same time period, to get a more accurate calculation of additional revenue.

represents the additional revenue Baylor receives for the misstated MCCs after controlling for possible differences in patient, regional, and claim characteristics. Relator further only attributed damages for the regression results that were statistically significant at a 99.9% level, meaning there is a less in 1 in 1,000 chance the additional revenue received is due to random chance.

106. Based on this bin-based regression, Relator's analysis shows that Baylor received an additional $61.8 million in false claims across all principal diagnosis categories due to fraudulent MCC upcoding. Table 17 demonstrates the additional revenue Baylor received for false claims across each of the Misstated MCCs.

Table 17. Damages by Specific Misstated MCCs.

Hospitals	Secondary MCC	Dollar Value of Fraud
Temple, Round Rock, Waco, and Dallas	Encephalopathy	$11,538,368
Temple, Round Rock, and Waco	Respiratory Failure	$26,998,225
Temple, Round Rock, and Waco	Severe Malnutrition	$23,258,777
	Total	**$61,795,370**

107. Relator's bin-based regression methodology represents a conservative approach for a variety of reasons. First, Relator only included principal diagnosis bins where Baylor used the Misstated MCC code at two times the rate of comparable hospitals or at least three percentage points of the entire patient population higher. A lower threshold could have been used and would result in higher damages. Additionally, Relator only considered claim groupings where there was less than a one-in-a-thousand chance that the difference in major complication rate at Baylor versus other hospitals was due to random causes.

108. Second, Relator's damage calculation is based on comparing Baylor to all other inpatient hospitals. To the extent other hospitals are engaging in the same fraudulent activity, it would make Baylor's actions seem relatively normal and would thus lead to a lower damage

estimate.[31] Indeed it is overly conservative to compare Baylor's fraudulent behavior to other hospitals also engaging in the same fraudulent activity; therefore Relator also undertook a different methodology to identify hospital systems based on the amount of fraudulent activity they have among all of their claims. If Relator were to remove from comparison the top third of hospital systems identified to have excessively billed Medicare and re-run the bin-based regression analysis, damages would total $72 million.

109. Relator's consideration of other possible explanations, such as claim characteristics, patient characteristics, and doctor practices, demonstrates that the excessive coding of Misstated MCCs is due to system-wide practices in place at Baylor. Additionally, the extremely high levels of statistical significance of the analyses across a variety of comparative settings indicate a nearly impossible probability that the practices are due to random chance. Relator's damages estimate of $61.8 million due to Baylor's fraudulent upcoding is conservative and the estimate is robust when controlling for a variety of factors.

V. CAUSES OF ACTION

COUNT ONE
Violation of the Federal False Claims Act, 31 U.S.C. § 3729(a)
(Against All Defendants)

110. Relator repeats and realleges each and every allegation contained above as if fully set forth herein.

111. As described above, Defendants have submitted and/or caused to be submitted false or fraudulent claims to Medicare by falsifying material information concerning patient diagnoses,

[31] As an example, the comparison set of hospitals includes Prime Healthcare Services, Inc., which is currently being sued by the US Department of Justice under the False Claims Act. *See* https://www.justice.gov/opa/pr/united-states-intervenes-false-claims-act-lawsuit-against-prime-healthcare-services-inc-and.

complications, and comorbidities; and by failing to report and return overpayments from Medicare within the required time period.

112. Defendants, by the conduct set forth herein, have violated:

a. 31 U.S.C. § 3729(a)(1)(A) by knowingly presenting, or causing to be presented, false or fraudulent claims for payment or approval; and/or

b. 31 U.S.C. § 3729(a)(1)(B) by knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim; and/or

c. 31 U.S.C. § 3729(a)(1)(G) by knowingly making, using, or causing to be made or used, a false record or statement material to an obligation to pay or transit money or property to the government, or knowingly concealing or knowingly and improperly avoiding or decreasing an obligation to pay or transmit money or property to the government.

113. The United States has suffered and continues to suffer damages as a direct proximate result of Defendants' false or fraudulent claims.

VI. PRAYER FOR RELIEF

WHEREFORE, Relator prays for relief and judgment, as follows:

(a) Defendants pay an amount equal to three times the amount of damages the United States has suffered because of Defendants' actions, plus a civil penalty against Defendants of not less than $10,957 and not more than $21,916 for each violation of 31 U.S.C. § 3729;

(b) Relator be awarded the maximum amount allowed pursuant to 31 U.S.C. § 3729(d);

(c) Relator be awarded all costs of this action, including attorneys' fees, expenses, and costs pursuant to 31 U.S.C. § 3730(d); and

(d) Relator and the United States be granted all such other relief as the Court deems just and proper.

VII. JURY TRIAL DEMANDED

Relator hereby demands a trial by jury.

DATED: August 7, 2018

Respectfully submitted,

/s/ P. Jason Collins
P. Jason Collins
jcollins@rctlegal.com
Jeremy H. Wells
jwells@rctlegal.com
Scotty G. Arbuckle, III
tarbuckle@rctlegal.com
REID COLLINS & TSAI LLP
1301 S Capital of Texas Hwy
Building C, Suite 300
Austin, Texas 78746
T: 512.647.6100
F: 512.647.6129

Counsel for Relator
Integra Med Analytics LLC